Gender as a moderating variable in online misinformation acceptance during COVID-19

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A R T I C L E   I N F O

A B S T R A C T

Misinformation remained a critical consideration during the COVID-19 that further cultivated fears leading to strong unrest among the public globally. This study clarifies certain misconceptions related to the pandemic by investigating whether factors such as altruism, entertainment, information-sharing, information-seeking, comprehensibility have impact on COVID-19 misinformation acceptance and sharing it in the UAE culture, with gender as a moderating factor. An online survey (google.com) was used, with a sample of 200 university students, and analyzed using PLS-SEM software to determine the effects of constructed factors. The findings indicated that entertainment, information-sharing, and information-seeking factors have impact on sharing COVID-19 misinformation, while comprehensibility has impact on acceptance of misinformation. Interestingly, gender was found to have no impact on all the constructed factors, suggesting that other moderating factors (e.g., age) need to be considered in future research. Generally, online users need to learn how to verify online information that they receive/share on other social media, especially regarding health concern.

1. Introduction

The fabrication of information for either political or financial gains goes back deep in the history of human communication. Rosetti and Matthews [1] sketched a timeline of the "information disorder" that starts with a propaganda campaign waged by Octavian to discredit Mark Antony in 44 BCE by claiming that Antony belonged to Egypt, not Rome. Recently, information communication technology (ICT), including social media, has greatly facilitated the dissemination of *fake news* [2,3], making it highly prevalent and turning it into a global concern [4–6].

Social media users are constantly exposed to a hard-to-control tide of information that originates primarily from independent and amateur content creators. Such users can spread this content and multiply its reach by sharing and liking it. This repetitious act of sharing unverified content would turn social media into venues for propagating *false* information and *fake news* [7]. They are also a

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powerful tool for the spread of copious amounts of uncensored media [8], which increases the spread of misinformation and manipulates the public's worldview [9–11].

Duffy et al. [12] indicate that fake news is intentionally created media that mimics legitimate news and is portrayed deceptively to make readers perceive it as legitimate, and it comes more prevalent in the digital world. While misinformation is false information that is spread, regardless of whether there is intent to mislead. The letter implies on some officials, media producers, and citizens that spread incorrect or misleading information to a large audience in order to further their goals [7]. With the spread of misinformation during the COVID-19 pandemic, it has affected almost every aspect of our lives. Several reports concerning COVID-19 were proliferating, making it difficult to differentiate between real and fake news [13]. As the worldwide quest for a cure for COVID-19 proceeded, the spread of misinformation on social media has become worse, undermining the efforts made by governments and healthcare professionals worldwide [14].

It is not clear, however, why users create and share misinformation during crises [15], which calls attention to examining and understanding the origins and causes of such attitude and its exponential rise on social media. With the outbreak of COVID-2019, misinformation started to online circulate vehemently, which was termed by the World Health Organization [16] as an infodemic. According to Awan et al. [17], the sharing of COVID-19-related misinformation was at its peak in the early months of the pandemic. For instance, Li et al. [18] reported that about one-quarter of the most-viewed YouTube videos on COVID-19 presented false information. A few studies focused on examining the reasons why users spread misinformation during the COVID-19 pandemic [19,20]. Others identified specific motivations for spreading misinformation during the pandemic (e.g., entertainment and self-promotion) [21]; altruism, or sharing without expecting anything in return [19]; and promotion of one's own perceptions rather than seeking scientific knowledge [22].

This active sharing of false health news on social media during the pandemic aroused both public and governmental concerns. Misinformation about medical conditions has been discovered to pose possible harm to the health of the public. Corroboration from the past has revealed that misinformation about medical conditions is common. Nevertheless, social media, which allows users to share information freely, has accelerated the spread of misinformation in the health ecosystem [15]. The dissemination of misinformation has made the authorities aware of the harm that it can do to the nation's political equilibrium. For example, the UAE government, like some countries, was aware of the influence of social media on its citizens, perhaps because of the Arab 2011 uprisings.

Thus, using the theories of electronic word-of-mouth (eWOM) and uses and gratifications, we created a hybrid holistic model to understand the predictors of sharing misinformation about COVID-19 on social media. We also incorporated an element of altruism to expand this hybrid model. To comprehend such an impact, we contend that findings from previous research on news-sharing can be extended to examine the dissemination of misinformation [23]. Given the scarcity of literature attempting to explain the spread of misinformation, this study builds on the work of Ma and Chan [23] and Thompson et al. [24], who studied and evaluated fake news sharing using those news-sharing factors. More significantly, the study aims at examining the impact of gender in a traditionally patriarchal culture on the acceptance of misinformation among social media users to understand the importance of raising consciousness and attention about the impact of gender on the sharing and acceptance of misinformation on social media.
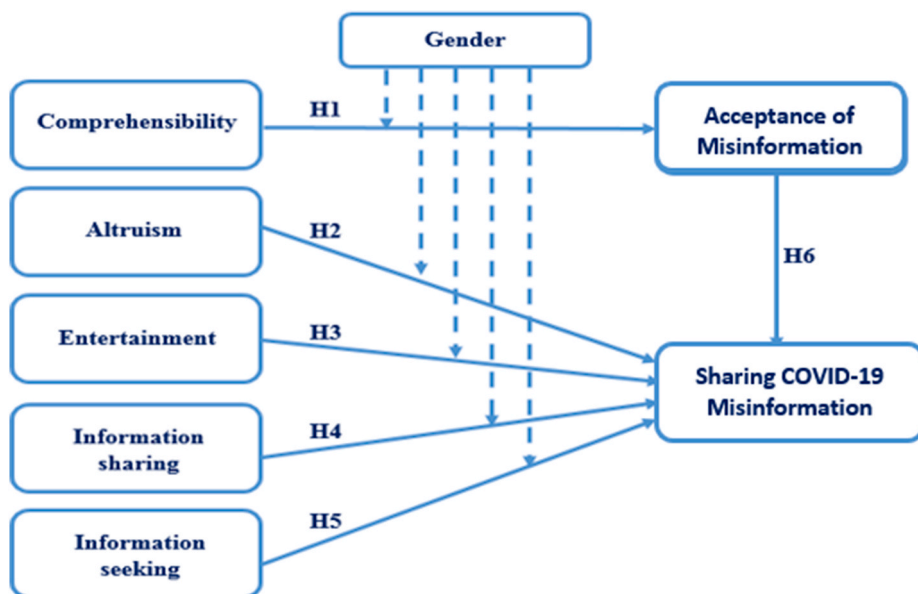

Fig. 1. Proposed conceptual model.

2. Hypotheses and the Research model

The models of technology acceptance suggest that specific attributes of innovations predict their adoptability in any social system. This study combines the literature on both the models of technology acceptance and the electronic word-of-mouth model to identify the major factors underlying the acceptability of misinformation (Fig. 1). Accordingly, the primary variable is the users' perceptions of the uses of technology that determine its acceptance (Davis, 1989). The adoption of technology has already been addressed in a variety of contexts, including e-learning [25], and e-governments [26,27]. However, the sharing and acceptance of misinformation on social media did not receive much attention in the same literature.

The eWOM model addresses the opinions, ideas, experiences, and preferences online shared by consumers. This user-generated content may provide readers with either real or false news. Several studies analyzed specific aspects of electronic word-of-mouth publications e.g., message comprehensibility and users' willingness to share different electronic word-of-mouth messages [28,29]. We also relied on the models of technology acceptance to assess why social media users accept online misinformation. Although the literature on technology adoption focuses more on technology than messaging, it adds value by providing methods for assessing and measuring the factors that determine users' acceptance of technology. Fig. 1 illustrated the factors that could influence the sharing and acceptance of misinformation based on the literature on the models of technology adoption and electronic word-of-mouth. The uses and gratifications theory (U&G) was also integrated into the model, as we postulated an association between altruism, entertainment, information seeking, and information sharing on social media, and the sharing of COVID-19 misinformation.

The U&G theory suggests that people actively choose media to fulfil their needs [30]. For audience activity, the theory predicts how the media affect individuals according to the gratifications they seek from the services offered by a medium. Accordingly, an individual's motivation to gratify their needs influences their choice of a specific medium, how that medium is used, and how its information is interpreted [31]. The U&G concept was applied in developing several research models [32]. For example, research shows gender-based differences in what individuals seek to gratify by using information and communication technology. Nasar et al. [33] reported that women used cellphones to satisfy more safety needs. They also used the Internet for more interpersonal communication and social gratifications, while men used it more for leisure gratifications [34]. The current study expands and combines those models to investigate how gender influences the spread and acceptance of misinformation about COVID-19 on social media in the United Arab Emirates.

2.1. Comprehensibility

Sasseen et al. [35] reported that the traffic from social media platforms accessed from the US. to news sites has increased by 57%. Almost a decade later, a survey conducted by the Pew Research Center (2021) showed that 48% of American adults get news from social media. The new smart devices have facilitated users' access, search, and retrieval of news, which has created new patterns of news consumption in the past two decades. Newman et al. [36] reported that the use of online news in Britain started to level off in 2009. Whether users consume news on social media networks incidentally or intentionally, the patterns of news dissemination and consumption have changed significantly globally, especially among the tech-savvy and digital-oriented audience.

During COVID-19, individuals sought more cognition to cope with the uncertainty that surrounded the spread, causes, and preventions of the viral infection. This led them to rely more heavily on social media to gather and share information about the pandemic [37,38]. More Slovenian users were found to processed information about the pandemic on social media and acquired more knowledge, the more they believed that social media news comprised "all essential facts about COVID-19" [39]. Ahmed and Rasul [40] found that those who relied on social media more frequently for news were more prone to believe COVID-19 misinformation and share it on social media.

2.2. Altruism

Altruism is defined as "the voluntary dissemination of information without expectation of reward" [41]. Sharing content with others without expecting anything in return is an example of altruistic behavior. An altruist social media user is voluntarily seeking ways to help others by sharing self-perceived beneficial information and news with those in need without asking for anything in return. Research about the sharing of knowledge, information, and news online has demonstrated several aspects of online altruistic actions. For example, research found that online altruism is positively connected with the voluntary collection and sharing of information. Those social media altruists seek to enlighten others and foster social cohesion without expecting money or rewards [23,41].

> The act of online altruism might come with a price, however. Duffy et al. [12] indicated that people who share information to help others do not always check the authenticity of that information or make sure it does not contain inappropriate safety advice. Therefore, it is logical to infer that such acts of informative online kindness, especially during times of crises, facilitate the spread of fake news and acts of kindness. Those who are more altruistic in nature may have spread misinformation about COVID-19 even though their motivation was to provide guidance and help others.

2.3. Entertainment

Using social media as a form of recreation and therapy has become common practice. People can satisfy their craving for entertainment when they use social media to kill time, engage in pleasurable pursuits, and escape from their mundane lives. Studies have

found that Facebook is primarily used for fun and recreation [42]. Kim et al. [43] found that the "like" button on Facebook is used to express opinions on a wide range of topics. They concluded that Facebook usage is positively associated with leisure time. However, some found that people generally do not like to share news online, suggesting that such behavior is unrelated to using social media for personal amusement [44].

Social media users might share news to alleviate boredom and fill their leisure time. Choi [45] reported that American adults "get enjoyment and feel pleasure from expressing their thoughts about news content" (p. 254). Social media users tend to fill their leisure time finding and sharing useful information with others [46] and might enjoy sharing information on social media sites because they want to share it with others in a social setting [47]. However, the literature does not show a consistent impact of the entertainment motivation on sharing news on social media. Baek et al. [42] did not find a significant correlation between sharing news on Facebook and the pass time gratification. Thompson et al. [24] also concluded that socializing and entertainment gratifications did not have a significant effect on sharing news online. We expect, however, an association between entertainment gratification and sharing news on social media because of the curfew imposed by authorities in the UAE during the pandemic. People had to involuntarily deal with social isolation and seek information about the virus to dispel insecurities and seek guidance. This could encourage some individuals to upload unverified information to pass time and seek entertainment.

2.4. Information-sharing

People are motivated to share information for different purposes [24]. The history of research into how information is shared is extensive [47]. McGonagle [5] found that the use of social media accelerated the spread of fake news online. Tandoc Jr. et al. [48] suggested that the ease with which news can now be shared via social media is to blame. This is because anyone can take part in the creation and dissemination of information. Chen et al. [49] stated that the pleasure that information-sharers derive from their actions is significantly correlated with the prevalence of misinformation. People are more likely to share misinformation for the sake of education than for the sake of pleasure. Due to the sheer volume of COVID-19-related content already available on social media, we suggest that the spread of misinformation is inevitable if users do not take the time to verify the accuracy of the data before sharing it. During the pandemic, when everyone wanted to be a reporter, we indicated that double-checking information before disseminating it is highly unlikely.

2.5. Information-seeking

Seeking information is the process of trying to get relevant and timely information through various sources. During COVID-19, news articles shared on social media platforms were among the sources used by users seeking news and information about the pandemic. Lampos et al. [14], stated that as the number of COVID-19 cases worldwide increased, the number of misleading or false stories also increased. This implied that many users turned to the Internet for advice on combating the virus, despite the spread of misinformation. Online users who tended to seek information about the pandemic were experiencing emotional distress because of misinformation and the exaggeration of risks [50]. This emotional distress, combined with individuals' natural tendency to reduce ambiguity during crises, may have driven them to seek and share more information on social media. Research also shows that the sharing of news on social media and the search for more information go hand in hand [49]. This could explain why social media users shared this amount of unverified information during the pandemic.

2.6. Acceptance and sharing of Covid-19 misinformation

The technology acceptance model (TAM) identifies the characteristics that enhance the adoptability of technology in different contexts. The model differentiates between individuals' intentions to use technology and their actual adoption of it [51]. Factors such as the perceived usefulness of technology and its perceived efficacy are expected to facilitate its acceptance among prospective users. Applying the same perspective to messaging, this study suggests that social media users would share the electronic word-of-month about COVID-19 they accept and perceive as beneficial with their social networks. The study, therefore, assumed.

H1. The perceived comprehensiveness of social media news has a significant impact on users' acceptance of COVID-19 misinformation.

H2. Altruism has a significant impact on sharing COVID-19 misinformation.

H3. Entertainment gratification has a significant effect on the spread of COVID-19 misinformation.

H4. Information-sharing gratification has a significant impact on sharing COVID-19 misinformation.

H5. Information-seeking gratification has a significant impact on sharing misinformation about COVID-19.

H6. Acceptance of misinformation about COVID-19 is associated with sharing news on social media.

2.7. Gender as a mediator

Previous research has found a gender gap in news consumption, with men consuming more news than women [52–54]. The same gender gap in the use of new communication technologies was also detected [55,56]. This gender gap is attributed to the widespread

belief that technology is male-dominated and that men are more proficient users of technology [56], social and cultural norms also allow men more access to technology [54,57].

However, with new online communication technology, women are more likely as men to have easy access to and greater anonymity on social networks. Aman and Jayroe [58] argued that the anonymity provided by the Internet has empowered women in the patriarchal society of Saudi Arabia. Balfaqeeh [59] suggested that online users are less likely to be held accountable for their activities when they hide behind a mask of anonymity, such as when they engage in trolling, fury, stalking, or deception. Accordingly, more than half of Saudi Arabia's bloggers are women, and they write mostly about issues affecting women. Celebrity women bloggers in Saudi Arabia, such as Farah's Sowaleep, Saudi Eve, and Thought in the Kingdom of Lunacy, challenge the authority of men [7]. Thanks to a petition started by women campaigners online, Saudi women can now legally drive.

Studies have found that the gender gap in adopting new communication technology is narrowing as online communication technology has become more affordable and accessible globally [60,61]. Research also shows that women tend to use social media more frequently, and they engage in discussing family activity and maintaining their relationships on social media platforms [62]. This accumulated literature about gender differences in consuming news, using technology, and seeking gratifications by using social media suggests gender would mediate the acceptance and sharing of misinformation about COVID-19 (Fig. 1).

Gender mediates the effect of comprehensibility (**M1**), altruism (**M2**), entertainment (**M3**), information-sharing (**M4**), and information-seeking (**M5**), on the acceptance and sharing COVID-19 misinformation.

3. Method

3.1. Participants

After the UAE University Students Research Evaluation Committee (Ref: ERSC_2022_703) granted approval to conduct this study in the fall of 2021–2022, we attached a consent form and information sheet to our questionnaire and shared with students who were assured of their anonymity. Respondents were also instructed that they were free to withdraw at any time, and they did not receive any remuneration for their participation. The survey was emailed to respondents and shared on the respective Facebook and WhatsApp groups for the university to increase response rates (Table 1). Out of 200 responses, only 176 completed questionnaires were received (88% completion rate).

3.2. Instrument

The survey included 19 items to measure the seven constructs. These items were adapted from previous research and were minorly adjusted to ensure it fits inside the structure (Table 2). This questionnaire was divided into three parts: the respondents' personal data; acceptance and sharing COVID-19 misinformation (3 items); and 14 items measuring altruism (3 items), comprehensibility (2 items), entertainment (3 items), information-sharing (3 items), and information seeking (3 items). These 14 items were scored on a five-point Likert scale (strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5)).

3.3. Pilot study

Twenty students were asked randomly from the target population for this pilot study to double-check the items' wording and length. The findings were incorporated into the main study, but additional data were also gathered from the pilot study. The 19-item achieved a satisfactory level of validity and discriminant reliability. The Cronbach alpha test was applied to assess internal reliability. Table 3 showed the reliability coefficients for the items measuring each construct were greater than 0.70, indicating a satisfactory level of reliability.

Table 1
The sample demographic characteristics.

Variable	N	%
Gender		
Male	64	36%
Female	112	64%
Age		
18–29	131	74%
30–39	19	11%
40–49	16	9%
50–59	8	5%
60+	2	1%
Education		
Undergraduates	138	78%
Graduate (Master)	17	10%
Graduate (Doctorate)	21	12%

Table 2
The adapted items and their sources.

Construct	Item	Instrument	Sources
Altruism	ALT1	I share Covid-19-related content because I enjoy helping people.	[19,41,
	ALT2	I share Covid-19-related content since it feels appropriate to help others to find solutions to their problems.	63]
	ALT3	I share Covid-19-related content to encourage and drive others.	
Acceptance of misinformation	ACC1	I am inclined to accept news I find on social media.	[7]
	ACC2	Views, clips, and comments posted on social media have an impact on me.	
Entertainment	ENT1	I enjoy sharing Covid-19-related content.	[19,24]
	1. ENT2	I share Covid-19-related content on social media since I find it amusing.	
	2. ENT3	It is thrilling to share Covid-19-related content on social media.	
Information-sharing	INS1	I share Covid-19-related content that could be helpful to others.	[19,24]
	INS2	I share Covid-19-related content to gain comments.	
	INS3	I share Covid-19-related content to promote information.	
Information-seeking	ISK1	I seek Covid-19-related content to help me retain vital information.	[19,64]
	ISK2	I seek Covid-19-related content since it is simple for me to access info.	
	ISK3	I seek Covid-19-related content to stay updated with the latest headlines and happenings.	
Sharing COVID-19 misinformation	SMI1	I shared Covid-19 virus info that I afterwards discovered to be untrue.	[19,65,
	SMI2	I shared Covid-19 news on social media seemed factual but was made up.	66]
	SMI3	I wasn't aware when I shared Covid-19 news that it was false.	
Comprehensiveness	COM1	I obtain sufficiently comprehensive news from social media.	[7]
	3. COM2	Social media provides me with all the news I need.	

Table 3
Convergent validity results which assure acceptable values.

Constructs	Item	Factor Loading	Cronbach's Alpha	Composite Reliability	Dijkstra-Henseler's rho (ρA)	Average Variance Extracted
Acceptance of misinformation	AFN1	0.871	0.753	0.784	0.792	0.533
	AFN2	0.833				
Altruism	ALT1	0.854	0.879	0.913	0.915	0.681
	ALT2	0.891				
	ALT3	0.824				
Comprehensibility	COM1	0.808	0.770	0.895	0.896	0.810
	COM2	0.746				
Entertainment	ENT1	0.859	0.895	0.927	0.930	0.761
	ENT2	0.744				
	ENT3	0.834				
Sharing Covid-19 misinformation	FNS1	0.871	0.868	0.920	0.923	0.792
	FNS2	0.833				
	FNS3	0.854				
Information-sharing	IS1	0.891	0.911	0.925	0.928	0.608
	IS2	0.724				
	IS3	0.819				
Information-seeking	ISK1	0.846	0.894	0.923	0.925	0.705
	ISK2	0.859				
	ISK3	0.844				

4. Findings

4.1. Data analysis

Data were analyzed by applying a two-step assessment approach that incorporates the structural model and measurement model by using the partial least squares structural equation modelling method (PLS-SEM). Given the research aim (e.g., prediction), the PLS-SEM is considered to be appropriated approach. It has the ability to model composites and factors making it a formidable statistical tool for new technology. It was also chosen because it can easily manage introspective research with complex models [67]. It is also an ideal option for conducting research that aims to advance an existing theory. PLS-SEM analyzes the entire model rather than breaking it up into pieces [68]. Hair et al. [67] clearly indicate that the PLS-SEM method is very appealing in social sciences research as it enables them to estimate complex models with many constructs, indicator variables and structural paths without imposing distributional assumptions on the data.

4.2. Convergent validity

The Cronbach's alpha which is used to assess construct reliability, ranges in value from 0.753 to 0.911, exceeding the threshold of 0.7 (Table 3). Hair et al. [69] indicate that to evaluate the measurement model's construct validity, which comprises the convergent and discriminant validity, as well as construct reliability (containing composite reliability, Dijkstra-Henseler's rho (ρA), and Cronbach's alpha). The findings demonstrated that the CR has values between 0.784 and 0.927, which were higher than the recommended value of 0.7 [70]. Alternatively, Dijkstra-Henseler's rho (ρA) reliability coefficient should be used to assess and publish construct reliability [71]. The reliability coefficient ρA, like Cronbach's alpha and composite reliability, should show values of 0.7 in the introspective study and values greater than 0.80 or 0.90 at more sophisticated levels. Each measurement construct's reliability coefficient ρA is higher than 0.70.

These findings support the construct reliability, and, in conclusion, all the constructs were adequately error-free. The results show that the proposed value of 0.7 stayed lower than the average value for each factor loading. To measure convergent validity, the average variance extracted (AVE) and factor loading must be put to trial [69,72]. According to Table 1, the AVE generated numbers between 0.533 and 0.810, which are greater than the 0.5 threshold level. Depending on these findings, convergent validity can be effectively obtained for all constructs.

4.3. Discriminant validity

Table 4 showed the results of the Fornell-Larker criterion support the prerequisites of validity testing because the AVE and square root of each construct are higher than its correlations with all other constructs [69,73,74]. Fornell-Larker and the Heterotrait-Monotrait ratio (HTMT) were the two parameters that were advised to be measured for discriminant validity [75]. The findings of the HTMT ratio demonstrate how the threshold value of 0.85 continues to be higher than the value of each construct [70]. These findings are used to calculate discriminant validity. Accordingly, there were no issues found while assessing the model's validity and reliability.

4.4. Hypotheses testing and coefficient of determination

Every route's variance description (R^2 value) and each connection's path significance in the research model were evaluated. Fig. 2 and Table 5 showed the formalized path coefficients and path implications. The combined assessment of the research hypotheses was conducted using structural equation modelling (SEM).

Four out of six research hypotheses were substantiated by the data (Table 5). All the constructs from earlier research were confirmed in the model (comprehensibility, altruism, entertainment, information-sharing, information-seeking). The R^2 values for accepting and sharing misinformation on COVID-19 ranged from 0.378 to 0.395, indicating that these constructs have a moderate predictive power [76]. The statistical testing accordingly supported hypotheses H1, H3, H4, and H5, but not H2 and H6.

Furthermore, perceived comprehensiveness of social media news (COM) has a significant positive effect on acceptance of misinformation (ACC) ($\beta = 0.472$, $p < 0.001$), supporting hypothesis H1. The relationships between altruism (ALT) and sharing COVID-19 misinformation (SMI) was not statistically confirmed, rejecting H2. Entertainment (ENT), information-sharing (INS), and information-seeking (ISK) have impacted on sharing of Covid-19 misinformation (SMI) ($\beta = 0.380$, $p < 0.001$), ($\beta = 0.372$, $p < 0.05$), and ($\beta = 0.382$, $p < 0.05$) respectively; hence H3, H4, and H5 were supported. Finally, acceptance of misinformation (ACC) has no significant impacted on sharing of Covid-19 misinformation (SMI) ($\beta = 0.142$, $p = 0.567$), rejecting H6.

Finally, the subsequent analysis of the moderating factor (gender) on the perceived comprehensiveness, altruism, entertainment, information-sharing, and information-seeking constructs was revealed (Table 6). The moderator influence can be used to describe how factor(s) impact the orientation/strength of correlation between the dependent variable and independent variables. The results demonstrated that none of the five assumptions were adopted, indicating that gender did not influence the association between the five constructs.

Table 4
The discriminant validity tests.

| The Fornell-Larker criterion							Heterotrait-Monotrait ratio (HTMT)					
	AFN	ALT	COM	ENT	FNS	IS	ISK	AFN	ALT	COM	ENT	FNS	IS
AFN	**0.858**												
ALT	0.332	**0.825**						0.453					
COM	0.283	0.373	**0.900**					0.639	0.321				
ENT	0.283	0.558	0.361	**0.872**				0.768	0.547	0.517			
FNS	0.473	0.504	0.603	0.289	**0.890**			0.593	0.767	0.613	0.641		
IS	0.283	0.616	0.496	0.336	0.512	**0.780**		0.736	0.761	0.567	0.787	0.708	
ISK	0.283	0.601	0.392	0.336	0.144	0.208	**0.840**	0.749	0.542	0.623	0.793	0.570	0.732
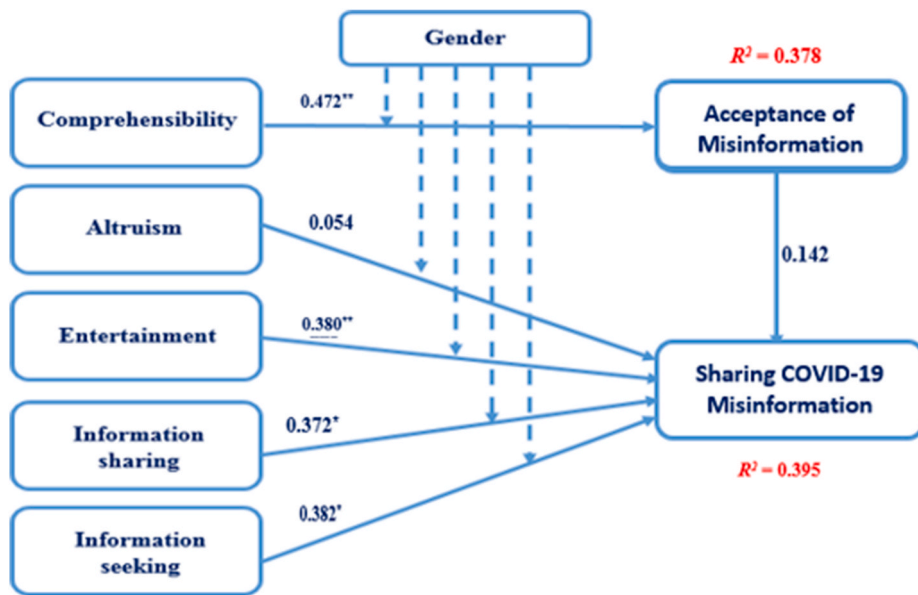
Fig. 2. Hypotheses testing results.

Table 5
Path analyses and testing of hypotheses.

H	Relationship	Path	t-value	Direction	Decision
H1	COM=>ACC	0.472	6.167**	Positive	Supported**
H2	ALT=>SMI	0.054	0.572		Not supported
H3	ENT=>SMI	0.380	3.068**		Supported**
H4	INS=>SMI	0.372	2.022*		Supported*
H5	ISK=>SMI	0.382	3.123*		Supported*
H6	ACC=>SMI	0.142	1.673*		Not supported

*p < 0.05, **P < 0.01. COM = comprehensibility, ACC= Acceptance of misinformation, ALT = altruism, ENT = entertainment, INS = information-sharing, ISK = information-seeking.

Table 6
Moderator analysis results.

M	Relationship	Path a IV=> Mediator	Path b => DV Mediator	Indirect Effect	SE Standard deviation	t-value	Bootstrapped Confidence Interval	
							95% LL	95% UL
M1	COM *GENDER=>ACC	0.316	0.318	0.100	0.062	6.015	−0.021	0.222
M2	ALT *GENDER=>SMI	0.124	0.318	0.039	0.216	5.413	−0.384	0.463
M3	ENT *GENDER=>SMI	0.335	0.318	0.107	0.251	6.164	−0.385	0.598
M4	INS *GENDER=>SMI	0.149	0.318	0.047	0.042	6.164	−0.035	0.130
M5	ISK *GENDER=>SMI	0.286	0.318	0.091	0.084	6.164	−0.074	0.256

Decision: all not supported.

5. Discussion and implications

5.1. Discussion

Our research on COVID-19 focused on how different motivations for sharing and seeking information contributed to the spread of misinformation. A model using the uses and gratifications and e-word-of-month theories was developed to predict and explain the acceptance and sharing of COVID-19 misinformation through social media. The findings showed that those who perceived social media as a sufficient and comprehensive source of news tended to accept social media COVID-19 misinformation. Excessive exposure to information and news about COVID-19 on social media might have caused information overload for users, leading them to be less

motivated to verify it [77]. Users who primarily relied on social media for news about the pandemic were more receptive to unverified information because it was, to them, the best and most up-to-date information available at a time that was filled with ambiguity and concern over public health. Over time, they have had an overabundance of news about the pandemic, leading them to develop a unique prior knowledge about it. According to Kožuh and Čakš [39], higher prior knowledge about COVID-19 leads to a higher level of trust in social media news. This trust might also explain the higher levels of acceptance of misinformation among those who heavily relied on social media for news.

The findings also showed that social media users in the UAE circulated COVID-19 misinformation out of a desire for entertainment. Not only did those social media users share news to inform their social networks about the pandemic, but they were also motivated by their need for entertainment. Research indicates that using social media habitually or as a hobby leads to fatigue, which in turn increases the likelihood that users may share false information to dispel such fatigue and boredom [44]. During the pandemic, users were concerned about their health, education, and employment. This multi-faceted concern, coupled with the curfew imposed on them, led them to consume and share news from social media to entertain themselves and be informed. This might have also been enhanced by the widespread sharing of humorous content and memes during the pandemic, which were found to provide a coping mechanism for the pandemic, especially for users suffering from anxiety [78,79]. This also replicates the correlation found between the gratification to pass time and users' intentions to share news on Facebook [24].

Our assumption is consistent with research showing that sharing news on social media helps maintain peace and harmony in people's lives. In the UAE, people tend to help one another when they heard of a potentially dangerous situation, regardless of the veracity of the report. People do this because they care about others and are motivated by the potential emotional impact and significance of the news on others [12]. During this time of heightened anxiety (the pandemic), people may also be more likely to distribute misinformation by sharing unproven preventative measures to deal with it. This support (H4) of the study, which predicted that information-sharing is another factor that would explain the spread of COVID-19 misinformation, conforming Lampos et al. [14] results' indicating the increase of misinformation/news headlines alongside the worldwide increase in COVID-19 cases.

Our research showed that curiosity about COVID-19 contributed to the proliferation of misinformation about the disease. This factor was the fourth most effective element in circulating misinformation during COVID-19. This finding supports our H5 suggesting that many people rely on possibly misinformation found online about how to deal with the virus. According to Ma et al. [23], the primary benefit of social media use is the enhanced access to relevant information. The need to know everything drives people to read and share misinformation on social media, as research suggests [12].

We expected that UAE social media users would share misinformation about the pandemic out of altruistic reasons, but the data did not support this hypothesis. Although previous research shows that online users are driven by a desire to help others by sharing information voluntarily [23,41] our findings did not show a similar impact for altruism. This might be explained by the collectivistic UAE culture, which values modesty and low self-enhancement. The UAE is considered as a collectivist society, where harmony is more valued than competition. In such society, people are less likely to be vocal about how they help others, as modesty best explains their low self-enhancement [80].

Furthermore, the empirical examination of the impact of gender on misinformation acceptance in the UAE is still lacking in the Arab region, although the impact of gender on spreading misinformation has received high attention in the West e.g., the US 2018 election. We found that combining these models produces a robust assessment of the prevalence of misinformation about COVID-19 and its correlation with other factors.

This quantitative approach to investigate the relationships between potential factors and the consumption of social media misinformation, first using a web-based survey and then with confirmatory factor analysis via structural equation modelling and Smart PLS. The mediator variable (gender) contributes minimally to spreading of misinformation about COVID-19. The results indicated that gender plays a relatively minor role in determining whether COVID-19 misinformation is accepted, suggesting that the sharing of misinformation about the pandemic is not predicted according to the users' gender.

5.2. Theoretical implication

Our results suggested that people's beliefs about spreading COVID-19 misinformation revolve around the four factors of comprehensibility, entertainment, information-sharing, and information-seeking, but not altruism. Practical implications are established. Our analysis found that information-seeking was the most significant factor in predicting the spread of COVID-19 misinformation. Users are encouraged to be caution when sharing online information, especially when such information includes instructions for keeping oneself and others safe. Our findings suggested that respondents were spreading COVID-19 misinformation, which has the potential to spread misconceptions and endanger people's health. This was necessary because some users may opt for treatments they read about online despite lack of medical evidence for their effectiveness [44]. Whether or not users realized it, their consumption and dissemination of COVID-19-related information contributes directly to the spread of misinformation and the detrimental impacts it has on society.

Our research highlighted several factors that led users to spread COVID-19 misinformation on social media. While other research has highlighted the importance of being aware of misinformation, this study confirms its function in mitigating the negative consequences of spreading misinformation during the pandemic. Furthermore, the entire global population, healthcare professionals, and in particular the UAE, must communicate with the public and control information flaw during such epidemic. It is very crucial that authentic information should be distributed through both online/offline channels. This will reduce the prevalence of Internet hoaxes claiming to offer effective therapies and prevention measures.

5.3. Mitigation suggestions based on the study

Based on the study's findings, some suggestions on actions that can be taken to mitigate the spread of fake news can be provided. These can be directed toward policy makers, governments, and other relevant stakeholders: (1) Increase media literacy by promoting media literacy programmes and initiatives that educate online users about the importance of verifying information before accepting and sharing it e.g., providing resources and tools to help users critically evaluate news and information on social media platforms. (2) Provide accurate and up-to-date information by the local government, health organisations, and reliable news sources should actively disseminate accurate and verified information about any issue through official channels. For example, ensuring the availability of reliable information, users are less likely to rely solely on social media for news. (3) Foster critical thinking by encouraging users to question and critically evaluate the information they encounter on social media. Promote a culture of fact-checking and encourage users to seek information from multiple reliable sources before accepting and sharing it. For example, emphasise the importance of verification by raising awareness about the importance of verifying information before sharing it. Encourage users to fact-check claims, look for corroborating evidence, and consult reliable sources before spreading any information. (4) Encourage responsible sharing by reminding users to consider the potential impact of their actions when sharing information. Encourage them to think critically about the potential consequences of spreading misinformation and to refrain from sharing unverified or sensationalised content. (5) Collaborate with social media platforms by working collaboratively with social media platforms to develop and implement measures that curb the spread of misinformation. This can include algorithms that prioritise reliable sources, warning labels on potentially misleading content, and penalties for repeat offenders. Overall, it's important that these suggestions should be implemented in a comprehensive and multifaceted approach involving various stakeholders, including local governments, social media platforms, news organisations, educators, and individuals themselves.

6. Limitations and future research

While we believe that our research adds to the existing body of literature, we also acknowledge that it has certain limits. To start with, we concentrated on the spread of COVID-19 misinformation globally, while focused on the UAE culture. The findings may, however, be generalized to other countries whose cultures are more like the UAE. Future research may choose to broaden this study's scope to research a different setting. Second, while altruism gratification did not influence the spread of misinformation, future research may examine other aspects such as social media weariness, self-disclosure, and online trust [39]. Third, we could not definitively indicate that gender would reduce the effect of providing misinformation. Therefore, others may try to replicate our study by including additional demographic factors (such age, wealth) in their own models. Our independent variables were shown to have sufficient and significant predictive power, even though our samples were on the small scale. Potential research can increase the sample size to better representative of the population.

7. Conclusion

Among our construct's comprehensibility, entertainment, information-sharing, and information-seeking that driver of the spread of misinformation during COVID-19, our analysis found that information-seeking was the strongest predictor in doing so among the surveyed students. However, this study did not find any conclusive evidence that altruism was significantly associated with the spread of misinformation. However, we indicated that users need to verify the accuracy of the material that they read and (re)-post on social media considering our research's findings and the escalating health concern caused by the spread of misinformation during the COVID-19. To do this, one must verify the source credibility [39], read beyond the story's headlines, investigate further to confirm the story's accuracy (e.g., checking its dates, authorship, data, and statistics), avoid falling for fabricated images (e.g., checking their authenticity), seek alternative viewpoints (e.g., consulting other sources), and if all else fails, consult experts. Based on our research, gender is neither a direct nor an indirect factor of the adoption or spread of misinformation regarding COVID-19.

For the Ethics statement, the ethics approval number is (ERSC_2022_703).

Author contribution statement

Ahmed Mansoori, Ph. D: Contributed reagents, materials, analysis tools or data.
Khalaf Tahat, Ph. D; Dina Tahat, Ph. D: Performed the experiments.
Mohammed Habes, Ph. D; Mokhtar Elareshi, Ph. D: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.
Said A. Salloum, MA: Conceived and designed the experiments; Analyzed and interpreted the data.
Hesham Mesbah, Ph. D: Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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