Developing a social media intervention to counter COVID-19 misinformation in Lebanon

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Title

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Abstract

The COVID-19 infodemic continues to spread, especially on social media. Misinformation spreads faster than accurate information hindering the public health response and generating distrust in institutions, fear, and panic. Health, eHealth, and media literacy are essential to respond to misinformation. This study explores how these different literacies are interrelated to develop a COVID-19 counter-misinformation media campaign. This paper presents the results of formative research conducted between April and June 2022. We used a web-based survey to assess eHealth literacy (with the homonymous scale eHEALS), COVID-19-related literacy, and media literacy (through the Critical thinking about media messages, CTMM scale). We explored the associations among these literacies and confounders such as internet use and sociodemographic factors. We used the findings to define our campaign's strategic goals. We recruited a sample of 388 internet users residing in Lebanon, primarily females, married and employed, with a university-level education. Participants showed overall high levels of eHealth literacy, COVID-19-related literacy, and media literacy, which were significantly correlated with one another. Despite these high levels of literacies, about 30% of the sample reported difficulties in appraising the reliability of COVID-19-related information online. This suggests that our campaign should focus on building media literacy skills and better empower individuals to identify COVID-19 misinformation. In our campaign, we will engage the highly health-and-media literate segments of the audience to diffuse reliable and accurate COVID-19-related information, among other segments.

Introduction and background/rationale

The World Health Organization (WHO) defines infodemic as "an over-abundance of information –some accurate and some not –that makes it hard for people to find trustworthy sources and reliable guidance when they need it" (WHO, World Health Organisation, 2020a). The COVID-19 infodemic continues to spread over the Internet, through widely available and accessible social networking sites, such as Facebook and Twitter, or via messaging applications such as WhatsApp or Telegram (Siddiqui et al., 2020). The COVID-19 infodemic is not a new problem, as several studies demonstrated a wide diffusion of rumors and misinformation on social networking sites for Zika, SARS, and Ebola outbreaks (Allgaier and Svalastog, 2015; He et al., 2015; Merino, 2014; Seltzer et al., 2017). Conspiracy theories, speculating treatments, and rumors constituted the bulk of the misinformation circulated by highly active individuals on social media intending to gain more popularity (Wang et al., 2019). Other research during a Zika outbreak showed that rumors were shared three times more than accurate information (Sommariva et al., 2018). The spread of misinformation is more evident when scientific evidence is lacking or with controversial issues, such as in the case of novel coronavirus outbreaks like SARS (Hartl, 2013). Some more recent research shows how social media content might even play a negative role in spreading fear (Kickbusch and Leung, 2020).

It has become increasingly challenging for lay people to navigate the sea of health information and discern among different sources. People need to have a high level of "critical health literacy," including a critical appraisal of data built on cognitive and social skills, scientific methods, research knowledge, and how media work and diffuse information (Chinn, 2011). However, critical health literacy goes beyond knowing the risks and should include elements of functional health literacy, which is the ability to discern correct and wrong health-related information (Abel and McQueen, 2020). In libertarian societies, individuals are expected to make rational choices; yet, because of the many uncertainties, we observe a variety of herd, irrational behaviors, such as flocking to grocery stores to buy masks, gloves, or hand sanitizers (Abel and McQueen, 2020).

In the context of the COVID-19 pandemic, it is a public health imperative to detect and provide a timely response to circulating rumors to mitigate a narrative of counter behaviors that can influence the way people comply with preventive recommendations. Preparedness is the key to responding to emergencies, including outbreaks, and well-planned communication strategies and toolkits are considered an integral part of public health responses. As outlined by WHO, Risk Communication and Community Engagement (RCCE) is an essential component of the preparedness and

response action plan to address this emergency, including developing systems for tracking and responding to rumors and misinformation (WHO, World Health Organisation, 2020b). Understanding the diffusion of information will help policymakers, and public health professionals forecast outbreaks, inform current public health measures, and adopt appropriate communication strategies for the present and future responses. The public health research agenda for managing the so-called "infodemic" (Mahajan et al., 2021; WHO, World Health Organization, 2021) recently put forward by WHO has underlined the research areas of focus, including monitoring the infodemic impact during emergencies, understanding how information originates and spreads, and evaluating interventions that develop resilience to misinformation.

In Lebanon, a small country in the Eastern Mediterranean, there are about 4.1 million social media users, representing about 60% of the active internet population, with 3.5 million people on Facebook, 1.6 million on Instagram, and 590,000 on Twitter (Kemp, 2021). Due to the financial and economic crises, the country is going through (Abouzeid et al., 2020), the trust in institutions has been constantly eroded, making it more difficult to diffuse information despite the significant penetration of social media use in Lebanese society. Public health guidelines are hardly followed, considering the diffusion of self-interest values that clash with communal ideals (Kabakian-Khasholian et al., 2020). Additionally, misinformation is well diffused on social media. A recent study showed that about 25% of the analyzed tweets on COVID-19 contained misinformation, and 17% included unverifiable information, which was shared mainly by informal, personal accounts (Kouzy et al., 2020).

To respond to these pressing demands, supported by a grant from the WHO, we have developed a project to develop an evidence-based social media campaign to address COVID-19 misconceptions among social media users in Lebanon. Within the formative research phase of our study, we assessed the basic level of health literacy, eHealth literacy, and COVID-19-related literacy to understand how to shape our campaign's strategy (i.e., towards building resilience to misinformation, critical health, or digital literacy, etc.). In this paper, we report the survey's preliminary results, which allowed us to refine the campaign goals.

Method / approach

We conducted a cross-sectional study based on a web-based questionnaire approved by the Institutional review board (ref. Nr. SBS-2021-0362).

Participants and recruitment: Participants were recruited through paid and unpaid social media posts on our institution's Facebook, Instagram, and Twitter profiles and posts shared among our personal social media profiles. To participate in the study, respondents had to be 18 and above, reside in Lebanon, and provide consent.

Questionnaire: We developed a bespoke questionnaire in English and Arabic, using validated instruments available in both languages.

eHealth literacy was assessed using Norman and Skinner's eHealth literacy scale (eHEALS) (Cameron D. Norman and Skinner, 2006), which generally has good internal consistency with $\alpha = 0.88$ (Cameron D. Norman and Skinner, 2006). We used the Arabic version used in a study conducted in Kuwait (Alhuwail and Abdulsalam, 2019) since, at the moment of writing the project, there were no studies that validated the eHEALS in Arabic. We also assessed COVID-19-related literacy using a battery of questions based on the eHEALS (Cameron D. Norman and Skinner, 2006) and developed for this specific study.

The COVID-19 literacy scale included three 5-point Likert items in Table 2 below. Like for the eHEALS, we computed a summary score for COVID-19 literacy.

Media literacy was operationalized through the Critical Thinking About Media Messages (CTMM) scale (Scull et al., 2010), which consists of six 5-point frequency items such as "I think about the things the advertisers do to get my attention" (never=1, always=5). The scale has shown good psychometric properties (McLean et al., 2016a, 2016b), with good internal consistency (α above 0.90) in the original study (Scull et al., 2010). Responses were summed to form a total score, ranging from 0 to 30. Higher scores reflected a higher media literacy.

We collected information about potential confounders such as sociodemographic variables (gender, age, marital status, employment, education) and internet use, as these have been previously reported to have associations with the health and eHealth literacy (e.g., Alhuwail and Abdulsalam, 2019; AlOthman et al., 2017; Tubaishat and Habiballah, 2016).

Internet use was assessed through the question, “On average, how many hours do you spend on the Internet per day?”.

Data analyses: We examined the associations between eHealth literacy, COVID-19 literacy, media literacy, and sociodemographic factors, including age, gender, and education level, commonly sociodemographic determinants of health literacy, and eHealth literacy. We used Spearman’s rho to examine the correlations between literacy scores (as they tend to be non-normally distributed). We used independent sample t-tests and ANOVA tests to compare the literacy scores across different socio-demographic characteristics and internet use categories. A p-value of < 0.05 was considered significant.

Results / findings

We collected 388 responses, mostly from females (277/388, 72%), almost equally distributed across age groups. Most participants declared being married or separated/widowed individuals (59%), employed (52%), with a university-level education (67%) – see Table A1 in Appendix for details.

The overall eHealth literacy score was 29.4 out of 40 points (SD=5.1), Covid-19-related literacy was 11.2 out of 23 points (SD=5.5), and media literacy was 19.9 out of 30 points (SD=5.5). All three variables were highly correlated, as shown in Table 1 below, suggesting that the three factors are strongly interrelated. On a 100% scale, eHealth literacy was 73%, COVID-19-related literacy was 48%, and media literacy was 66%. This suggests that the weakest spot in our sample was the COVID-19-related literacy, followed by media literacy.

Table 1. Correlations among different types of literacy

		n	Spearman's rho	p
eHEALS	- Media literacy	388	0.160 **	0.002
eHEALS	- C19 literacy	388	0.345 ***	<.001
Media literacy	- C19 literacy	388	0.168 ***	<.001

* p < .05, ** p < .01, *** p < .001

While there was no significant association between literacies and each sociodemographic factor (age, gender, education, marital status, and education), the various literacy scores progressively increased with internet use. While the association with media literacy was not significant ($F_{3,333}$=0.558, p=0.643), it was significant for eHealth literacy ($F_{3,333}$=4.119, p=0.007) and COVID-19 literacy ($F_{3,333}$=3.956, p=0.009). In other words, the higher the internet use, the higher the eHEALS scale (perceived level of eHealth literacy) and COVID-19-related literacy. This means that internet use could and should be used as a variable to segment our target audience.

When we inspected each literacy scale at the item level response, we found that 30% of the sample found it difficult or very difficult to recognize whether COVID-19 information was reliable (see Table A2 in appendix). This urged us to consider segmenting our target audience according to this dimension when considering the vital factor of critical media literacy.

Discussion

In addition to enriching our understanding of eHealth literacy in Arab countries, our study assessed the relationship of eHealth literacy with media literacy and COVID-19-related literacy. The reported levels of eHealth, media, and COVID-19 literacies in our sample were high.

The level of eHealth literacy was slightly higher than the one reported in other Arab countries (Alhuwail and Abdulsalam, 2019; Tubaishat and Habiballah, 2016) and comparable to high-income countries (e.g., Sudbury-Riley et al., 2017). The lack of variation in the eHealth literacy scale by age observed in our study was also reported in Kuwait, where higher levels were found among males (Alhuwail and Abdulsalam, 2019). In this study, we recruited individuals from a high socioeconomic status, demonstrating how samples recruited using social media represent an elite that might not represent the substrate of the population (Telvizian et al., 2020). The survey was mainly distributed through the social media pages of the Faculty of Health Sciences, which caters to an audience with a high educational level compared to the general public. Contrary to reports from other Arab countries, we did not observe significant

variations by gender or other sociodemographic factors. However, this might be due to the remarkably homogenous sample we recruited.

This suggests that public health campaigns addressing COVID-19 using complex content that demands high literacy might be appropriate. Social media users already have high levels of health literacy. However, this is another saying that campaigns preach to the converted. Hence, alternative strategies should be developed to reach those internet users that do not possess high levels of health and critical media literacy. . The nature of our sample can partly explain this finding. It is important to note that our questions assessed the perceived competency in determining the quality and that further investigation into the predictive value of this perception with actual skills is warranted.

The correlation between eHealth literacy and media literacy was significant, showing how critical thinking of media messages might also reflect high eHealth literacy scores. A recent systematic review of the literature showed that critical thinking was significantly related also to the health literacy (Seedaket et al., 2020) and others indicate that critical thinking is a part of the definition of the health literacy itself (Levin-Zamir and Bertschi, 2018; Liu et al., 2020). Our findings emphasized the close association between these two concepts and urged us to think about prioritizing the campaign on building media literacy skills to improve eHealth and health literacy. Given that our sample demonstrated gaps in their ability to identify and appraise the quality and reliability of sources of COVID-19 information online, future campaigns should focus on building critical media skills.

Respondents to our survey considered their ability to search for health information online as an essential skill, which they used to improve their understanding of specific diseases and treatments. This finding, together with the high level of eHealth literacy in our sample, points to the importance of capitalizing on this audience's competence and engaging them more digitally as part of social media campaigns. Given that around 30% of the sample reported difficulty in assessing the reliability of the COVID-19-related information they find online, it is necessary to use social media to engage this audience in learning skills they can apply to check the reliability of posted information. This must be considered in future social media campaigns on COVID-19 prevention.

Conclusions

Our findings highlight that despite the high eHealth literacy level in our sample of social media users, there are still some gaps in their skills related to COVID-19 literacy and media literacy. The findings were used to generate ideas on how to define our target audience segmentation and how to focus on the upcoming media campaign.

Our campaign should focus on building critical media skills to empower individuals to detect and combat misinformation. Our media campaign should involve and engage audiences with high eHealth literacy levels in social media movements becomes imperative given the growing use of social media to access COVID-19-related information and the infodemic surrounding the pandemic.

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Appendix

Table A1. Sample characteristics (n=388)

		N	%
Gender	Male	107	27.9
	Female	277	72.1
Age	18-24	60	15.7
	25-34	105	27.4
	35-44	86	22.5
	45-54	79	20.6
	55 or above	53	13.8
Marital status	Married	198	52.0
	Not married	157	41.2
	Separated/Divorced/Widowed	26	6.8
Employment Status	Student	48	12.6
	Employee (public)	35	9.2
	Employee (private)	149	39.1
	Self employed	52	13.6
	Retired	6	1.6
	Unemployed	91	23.9
Highest educational level	University (Graduate) or higher	154	40.0
	University (Undergraduate)	104	27.0
	High school or less	82	21.3
	Technical school (vocational)	45	11.7
On average, how many hours do you spend on the Internet per day?	Less than 1 hour	26	6.9
	1-3 hr.	138	36.5
	3-5 hr.	121	32.0
	More than 5 hours	93	24.6

Table A2. COVID-19 related literacy

		n	%
How much do you agree with the following statements?			
I can assess health information related to COVID-19	Strongly agree	58	14.9
	Agree	213	54.9
	Neutral	76	19.6
	Disagree	30	7.7
	Strongly disagree	11	2.8
I can find good, reliable health information related to COVID-19 from the internet and social media	Strongly agree	60	15.5
	Agree	212	54.6
	Neutral	81	20.9
	Disagree	29	7.5
	Strongly disagree	6	1.5
I check different websites to see whether they provide the same information related to COVID-19	Always	107	27.8
	Frequently	91	23.6
	Often	120	31.2
	Seldom	47	12.2
	Never	20	5.2
When searching the Internet for information on COVID-19			
How easy or difficult is it for you to decide whether the information is reliable or not?	Very easy; I always know how to tell whether the information is reliable or not	70	18.3
	Easy; most of the time I can recognize whether the information is reliable or not	195	50.9
	Difficult; I am barely able to recognize whether the information is reliable or not	99	25.8
	Very difficult; I never recognize whether the information is reliable or not	19	5.0
How easy or difficult is it for you to use the information you found to make decisions about your health? (Protective measures, hygiene regulations, transmission, risks, prevention…)	Very easy	87	22.7
	Easy	236	61.6
	Difficult	52	13.6
	Very difficult	8	2.1