A Visual-based Universal Symptom Capture App for Patients with Low Health Literacy
Ismail, Aziza[1], Waldeisen, John R[1], Johnson-Agbakwu, Crista[2], Singh, Sonam[3]
[1]LiteraSeed, LLC, [2]District Medical Group, Arizona State University, Refugee Women's Health Clinic, [3]District Medical Group, Valleywise Health

Background

In the U.S., almost 120 million people, or 36% of the population, have low health literacy, which disproportionately affects both racial and ethnic minority groups and patient populations that are uninsured, underinsured, or on Medicaid/Medicare. Additionally, 67.3 million (21.9%) U.S. residents speak a non-English language as their primary language. Miscommunication causes 78% of misdiagnoses resulting in 80,000 avoidable hospital deaths each year. Vulnerable communities, including racial and ethnic minorities and those under- or uninsured, are at a 2x higher risk of avoidable patient harm and death due to barriers of language, culture, literacy, and access. In addition to the fatalities caused by systemic health disparities, inefficiencies and poor outcomes result in $238 billion each year in avoidable costs to the U.S. healthcare system.

Research Question

Current digital solutions are not targeted to the needs of linguistically and culturally disparate populations and not personalized to the needs of individual patients to make accurate diagnoses. Where language is an issue, video remote, telephonic, and in-person interpretation services can be logistically challenging to obtain and costly, which can result in a denial or delay of services for patients with language barriers. Language barriers aside, basic medical communication and health literacy, such as knowing what symptoms and how to describe them, remain a challenge for most Americans as doctors are pressed for time and lack the time to listen to their patients' stories.

Methods

A patient feasibility study (n=300) is ongoing and intended to measure effectiveness and inform the design of our visual symptom capture tool. The study, completed at the Valleywise Health Refugee Women's Health Clinic in Phoenix, AZ, gathers both quantitative and qualitative symptom-based data self-reported by non- and mixed-literacy patients. We compare the accuracy of the patient's self-reported symptoms to the symptoms reported by the provider when assisted by a certified medical interpreter.

Results

Preliminary study results (n=30) demonstrate that non- and mixed-literate patient use of the LiteraSeed picture-based app identifies symptoms that could lead to misdiagnosis or underdiagnosis in 20% of patient cases. On average, we found that patient self-reporting increased relative symptom identification by 0.26 more symptoms per patient. LiteraSeed identified the same symptoms in 53.3% of cases (16 out of 30), identified more symptoms in 20% of cases (6 out of 30, averaging 2.6 more symptoms per patient), and underreported symptoms in 26.7% of cases (8 out of 30, averaging 1 less symptom per patient).
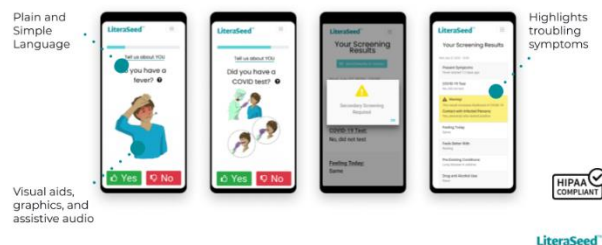
Conclusions

LiteraSeed's visual-based communication tool allows patients to self-report symptoms that would have otherwise gone unidentified. LiteraSeed can support medical providers in their diagnosis leading to greater patient safety and improved patient experience. Next steps include the expansion of LiteraSeed to address maternal health conditions.
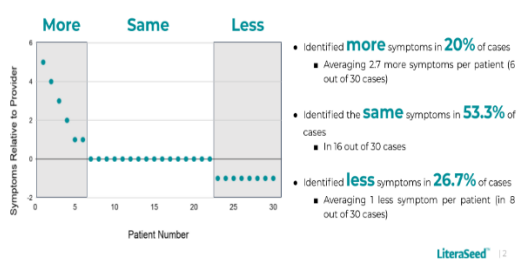
Implications

LiteraSeed's visual-based symptom capture app is solving a critical need in healthcare to support communication of medically underserved populations with low literacy and low health literacy. Our vision for this product is to scale it to a wider population, other medical specialties, and across the continuum of care.

INTERACTIVE CONDITION
Assessment and Monitoring

More   Same   Less

- Identified **more** symptoms in **20%** of cases
  - Averaging 2.7 more symptoms per patient (6 out of 30 cases)
- Identified the **same** symptoms in **53.3%** of cases
  - In 16 out of 30 cases
- Identified **less** symptoms in **26.7%** of cases
  - Averaging 1 less symptom per patient (in 8 out of 30 cases)

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Mitigating infodemics: The relationship between news exposure and trust and belief in COVID-19 fake news and social media spreading

Hitti, Eveline[1], Melki, Jad[2], Tamim, Hani[1], Hadid, Dima[3], Makki, Maha[1]

[1]American University of Beirut, [2]Lebanese American University, [3]American University of Beirut Medical Center

Background

Misinformation surrounding COVID-19 poses a global public health problem that adversely affects governments' abilities to mitigate the disease and causes accidental deaths and self-harm due to false beliefs about the virus, prevention measures, vaccines and cures.

Objectives

We aim to examine the relationship between exposure to and trust in COVID-19 news (from Televi-sion, social media, interpersonal communication) and information sources (healthcare experts, government, clerics) and belief in COVID-19 myths and false information, as well as critical verification practices before posting on social media.

Methods

We use a cross-sectional researcher-administered phone survey of adults living in Lebanon between March 27 and April 23, 2020.

Results

The sample included 56.1% men and 43.9% women, 37.9% with a university degree, 63.0% older than 30, and 7% with media literacy training. Those who trust COVID-19 news from social media [95%CI:(1.05–1.52)] and interpersonal communication [95%CI:(1.25–1.82)], and those who trust information from clerics [95%CI:(1.25–1.82)] were more likely to believe in COVID-19 myths and false information. University graduates [95%CI:(0.25–0.51)] and those who trust information from government [95%CI:(0.65–0.89)] were less likely to believe in myths and false information. Those who believe in COVID-19 myths and false information [95%CI:(0.25–0.70)] were less likely to engage in critical social media posting practices. Only those who underwent media literacy training [95%CI:(1.24–6.55)] were more likely to engage in critical social media posting practices.

Conclusions

Higher education and trust in information from government contributed to decreasing belief in COVID-19 myths and false information. Trust in news from social media, interpersonal communication and clerics contributed to increasing belief in COVID-19 myths and false information, which in turn contributed to less critical social media posting practices, thereby exacerbated the infodemic. Media literacy training contributed to increasing critical social media posting practices, thereby played a role in mitigating the infodemic.

Implications

Results of this study show that only media literacy training predicts higher likelihood of engaging in critical verification practices for social media sharing, which emphasizes the importance of media literacy training in mitigating the infodemic. Our findings raise a cautionary note about relying on interpersonal discussions and campaigns that exclude healthcare professionals, particularly for emerging diseases where knowledge about them is evolving and changing, especially for individuals with low education and for diseases prone to stigmatization, as is the case for COVID-19.

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Table 1: Sample demographic characteristics

Media Exposure (TV/Social media)		
		Total N=792
Gender	Men	443 (56.1)
	Women	346 (43.9)
Age	≤30	288 (37.0)
	>30	491 (63.0)
Education	<University	477 (62.1)
	University	291 (37.9)
Media Literacy	No	736 (93.0)
	Yes	55 (7.0)

*Tables 2 & 3 available upon request

Assessment of Internet-based Medicaid Enrollment Materials and Resources
Wallace, Lorraine[1], Prabu, Varsha[1], An, Bryan[1]
[1]The Ohio State University

Background
In November 2020, approximately 72 million Americans—approximately 1 in 5 individuals—received Medicaid benefits. Misunderstanding of eligibility requirements, minimal health insurance-related knowledge, lack of required documentation, limited internet access, cost and difficulty obtaining information are common Medicaid enrollment barriers. Purpose: The purpose of this study was to conduct a comprehensive health literacy-related and content assessment of state government Internet-based Medicaid enrollment materials and resources.

Methods: In February 2021, we conducted a comprehensive health literacy-related and content assessment of state government Internet-based Medicaid enrollment materials and resources. We used the established PMOSE/IKIRSCH tool to evaluate document complexity of English-language paper Medicaid enrollment applications. Criteria from the User-Friendliness Tool (UFT) was used to evaluate the following layout characteristics: font size ≥12 points; avoidance of all-capital letters, italics, and specialty fonts; use of ample white space; short paragraph lengths (<5 lines per paragraph);

and extent of well-organized information. We reviewed government Medicaid platforms and assessed availability (yes or no) of (1) on-line enrollment option, (2) toll-free telephone assistance and (3) live chat function. Descriptive statistics were using calculated, using SPSS+ Version 27.0, to assess layout and document features of English-language paper Medicaid enrollment applications and depict scope of Internet-based Medicaid enrollment resources.

Results
Forty (n=40; 78.4%) English-language paper Medicaid enrollment applications were available on government platforms. Twenty-eight (n=28; 54.9%) government platforms included a Spanish-language paper Medicaid enrollment application. Four (n=4) government platforms offered paper Medicaid enrollment applications in Mandarin, Russian, and/or Vietnamese. Document complexity, based on PMOSE/IKIRSCH scores was follows: level 3—moderate (n=11; 27.5%), level 4—high (n=27; 67.5%) and level 5—very high (n=2; 5.0%). An on-line Medicaid enrollment option was nearly universal. Medicaid government platforms were more likely to provide toll-free telephone assistance (n=34; 66.7%) than a live chat function (n=10; 19.6%). Seven (13.7%) states offered both toll-free telephone assistance and a live chat function to support Medicaid enrollment.

Conclusions
Of government platforms offering a paper Medicaid enrollment application, while all had an English-language option available, just over half provided a Spanish-language version as well. Given the number of Spanish speakers throughout the US, all states should consider providing a paper Spanish-language enrollment application on their government platforms as well. Overall, document complexity was high or very high as a large volume of information is required to apply for Medicaid coverage. Another important finding was that toll-free telephone assistance was more widely available than live chat functions across all states. Our

work suggests the need for states to leverage technology in creation of resources to match language and cultural needs of the diverse US population.

Understanding Critical Health Literacy: Theoretical and Measurement Issues
Wong, Eliza[1], Tian, Cindy Yue[1], Mo, Phoenix Kit-Han[1], Dong, Dong[1]
[1]Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Background

Critical health literacy (CHL) refers to the individuals' cognitive and social skills which can be applied to critically analyse information and to use this information to have better control over life events and situations. This domain CHL is underexplored. It is not clear what specific abilities are needed to adequately become a "critically health literate" citizen and how to effectively measure these abilities.

Objectives: This study aims to address the gap on conceptualization and measurement of CHL. Methods: A literature review was conducted to identify relevant studies published from 1990 to 2021 in three electronic databases (Medline, Scopus, and Web of Science).

Results

The review identified a total of 58 articles. By systematically building on past research, three dimensions of CHL: (1)"critical appraisal of information", (2)"understanding social determinants of health (SDH)", and (3)"actions to address SDH" were proposed. A distinct set of skills and measurement approaches of each dimension were also described: (1) Dimension 1: includes abilities to evaluate the information in terms of its credibility, reliability, validity, and applicability. These competences were measured by self-reported and performance-based questionnaires. (2) Dimension 2: conveys individuals' understanding of the relationship between how individuals experience social determinants and the impact of the determinants on health; and understanding of the relationship between SDH and health inequities. These understandings were measure by quantitative methods (i.e. self-reported questionnaire) and qualitative methods (i.e. in-depth interview). (3) Dimension 3: From the direct way, it can be reflected by individuals' frequency of participating in certain actions to address SDH (including community-level and interpersonal-level activities) in a given time. While from the indirect way, it can be predicted by its link with other concepts such as health-related empowerment and social capital. These components were usually measured by self-reported questions.

Conclusions

Our study provided a thorough and systematic analysis of the skills included in CHL and current approaches to measure them. Health literacy research can profit from a selection of them by elaborating a consistent concept of CHL and thereby fostering the development of a more holistic measure.