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Perceptions of the SARS-CoV2 pandemic: a small comparative survey analysis between language preference populations in a United States community health center

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ABSTRACT

In 2019, a new variant of coronavirus, SARS-CoV-2 (COVID-19) created a global pandemic that has highlighted and exacerbated health disparities. Educating the general public about COVID-19 is one of the primary mitigation strategies amongst health professionals. English is not the preferred language for an estimated 22% of the United States population making effective mass communication efforts difficult to achieve. This study seeks to understand and compare several topics surrounding COVID-19 health communication and healthcare disparities between individuals with English language preference (ELP) and non-English language preference (NELP) within the United States. A survey available in seven languages asking about knowledge and opinions on COVID-19, vaccines, preferred sources of health information, and other questions, was administered February-April 2021 to patients at an urban federally qualified health center that also serves global refugees and immigrants. Descriptive statistics and comparative analysis were performed to identify differences between ELP and NELP individuals. Analysis of 144 surveys, 33 of which were NELP, showed 90.97% of all patients agreed that COVID-19 was a serious disease and 66.67% would receive the COVID-19 vaccine. There were numerous differences between ELP and NELP individuals, including trust in government, symptom identification, preferred source of health information, and feelings that cultural needs had been met. This study has identified several significant differences in patient perceptions relating to the COVID-19 pandemic when comparing NELP to ELP and highlighted areas where improvement can occur. Applying this information, easily utilized targeted resources can be created to quickly intervene and address health disparities among patients seeking care at an urban community health center.

Introduction

The COVID-19 pandemic began in December 2019 when the SARS-CoV-2 was first identified in Wuhan, China [1,2]. COVID-19 is from the same viral family that is responsible for the common cold and the SARS outbreak of 2002 [3,4]. Since it was first identified, the virus has spread worldwide and was responsible for over 174 million confirmed cases and over 3.78 million deaths by June 2021 according to the World Health Organization [5]. Although most individuals experience mild to moderate respiratory infections, those with advanced age, low socioeconomic status, or significant medical comorbidities are at increased risk of severe disease and death [2,6,7]. Beyond the staggering impact of COVID-19 on the global medical community, it has had significant impacts on global economics, trade, legislation, and day-to-day life [1]. It has also illuminated areas of deficiency within our health system and highlighted the disparities that exist.

Research continues to illustrate the far-reaching impact of healthcare disparities on an individual and their communities [8]. The pandemic has accentuated these disparities and showcased the multifaceted ways that social determinants of health influence public health outcomes [6–9]. Accessible information and services in an individual's preferred language is an important determinant of one's ability to engage with public and preventive health services [10–14]. A direct correlation between refugee English proficiency and health literacy has been reported [11]. Additionally, individuals with higher levels of English proficiency were in better overall health [11]. Most medical information in the United States is dispersed in the English language, or sometimes additionally in Spanish. Language barriers cannot be quickly or easily overcome, leaving non-English language preference (NELP) populations to navigate through our complex healthcare system [10,12,15,16]. This can be a daunting task for anyone, even those with English language preference (ELP), due to the difficulty in finding

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medical providers accepting new patients, scheduling and traveling to appointments, understanding insurance coverage and the cost of healthcare, and finally understanding the medical information being discussed at the appointment. These topics are tied to health literacy which refers to one's ability to obtain, understand, and act on health information. One review indicated that less than fifty percent of ELP individuals have the functional health literacy to improve their health status [17]. With this in mind, trying to navigate this system in a different language demonstrates only one of the difficulties these patients face. Language barriers contribute to poor access to medical care with worse outcomes, inviting a call to action for health systems and centers to take the necessary steps to ensure these patients receive culturally sensitive care [10–12].

Over the past decade, refugee resettlement in the United States has averaged over sixty-six thousand individuals annually [18]. States can also receive secondary migrants and immigrants seeking permanent citizenship as part of the asylum or standard immigration process [19]. According to the Centers for Disease Control and Prevention (CDC), individuals seeking relocation to the United States undergo screening exams, immunizations, and treatment for medical conditions if necessary [20]. In recent years, the majority of individuals undergoing resettlement have been from the Democratic Republic of the Congo, Myanmar, and Ukraine with individuals from other developing countries within Africa, Asia, and the Middle East [18,21]. Throughout this process, individuals can face additional obstacles due to their NELP status such as finding stable housing, employment, and community resources. These resettlement and assimilation challenges have been shown to take up to a decade to overcome [22–24]. Refugee and immigrant patients who are new to the United States are at increased risk for experiencing compounding health disparities when considering their intersecting risk factors associated with race, ethnicity, culture, migration history, and language preference [8,11–16,25]. Additionally, it has been shown that NELP patient populations suffer more medical errors than ELP patients [26,27]. Although the individuals undergoing the resettlement process have a standardized initial examination, forcible displaced migrants and refugees often suffer the triple burden of infectious disease, chronic disease, and mental health conditions that need continued evaluation, treatment, and resources to support a healthy and productive life in their new home [28]. Therefore, providing healthcare access, information, and education in these patient's preferred language and in several modalities, such as educational pamphlets, videos, lists of local resources, or individualized discussion with a healthcare professional, early on in their arrival to the United States is critical.

The COVID-19 pandemic prompted quick and broadly sweeping interventions which were implemented to mitigate the virus. This led to extensive news coverage, special reports, countless social media posts, billboards, pamphlets, and newsletters [29]. The goal was to get the information to the general public as quickly as possible; however, it was done primarily in English [30]. Although numerous state departments gradually included Spanish and American Sign Language, it was several months after the initial information was disseminated that the Centers for Disease Control and Prevention (CDC) compiled a library of COVID-19 relevant information in a wide variety of languages and modalities [30]. Although this was beneficial, no intervention was uniformly implemented. This means NELP individuals had to find information on their own instead of receiving health information in their preferred language from a medical professional, increasing the risk of misinformation, and possibly exacerbating the disparate care for already vulnerable populations.

Immigrants and refugees have been shown to have significant barriers limiting their access to medical care [6,11,31], but few studies have published data on what kind of health communication or education these patients find most meaningful and therefore what interventions would improve their care and health literacy. This study aimed to gain insight into the health literacy, perceptions of COVID-19, and perceptions of the COVID-19 vaccines from this population and see how they differ depending on language preference. We sought to better understand what disparate healthcare education these populations continue to face, how they obtain healthcare information, how they wish to receive healthcare information, and how they feel their needs could be better met within the pandemic. With this information, we hope to establish and shape culturally sensitive resources and targeted health education delivery, empowering those with NELP with the healthcare information they need to make the best-informed care decisions.

Materials & methods

A cross-sectional study was conducted from February to April 2021 and included 144 participants at a Federally Qualified Health Center (FQHC) in a midsized Midwestern city. It was a small pilot study done with limited resources during a time when the information around COVID-19 and vaccines were changing rapidly, in order to identify any trends and better serve this population's informational needs. Individuals eligible for the study were 18 years of age or older

and sought care at the community health center. Survey administration was given either at a patient visit, at a vaccine visit, or following a visit at home using a QR code link. Convenience sampling was used by approaching participants while waiting for their appointment to begin with 90% of individuals electing to complete the survey. This study was approved by the associated university's Institutional Review Board in partnership with the FQHC.

Patients considered eligible for the study were asked to self-administer the survey and complete the questionnaire on paper or a phone using a QR code or link using a Research Data Capture (REDCap) tool [32]. The paper option was available to patients in English as well as Arabic, Creole, French, Kinyarwanda, Spanish, and Swahili based on our FQHC's global patient population. The survey was professionally translated into these languages utilizing Vocalink, a service that ensured the integrity and intention of the questions remained the same in all languages. Interested participants were informed about the study's objectives and duration of survey administration which was approximately 15 minutes. Subsequently, electronic informed consent was obtained. Participants who completed the survey received a $20 gift card for Amazon or Kroger.

The questionnaire consisted of demographic information and a COVID-19 questionnaire. The demographics covered topics such as nationality, socioeconomic status, country of birth, time spent in the United States, languages spoken, employment status, education level, and household composition. The bulk of the questionnaire obtained information on patients' experiences and beliefs regarding the COVID-19 virus and vaccine. The survey questions were designed according to the CDC's COVID-19 guidelines and adapted questions from the FluTEST study [33]. The questions employed Likert scales, multiple-choice, and minimal open responses to assess patients' knowledge of COVID-19 symptoms and management, personal response to the COVID-19 pandemic and sources used and trusted to obtain information regarding the COVID-19 pandemic.

Descriptive statistics were conducted to describe the study sample with frequencies and percentages for all categorical variables. Due to lack of variability, Likert style agreement questions were dichotomized into agree (strongly agree and agree) and disagree (strongly disagree, disagree, and neutral). To examine differences in COVID-19 vaccine attitudes and perceptions between ELP and NELP populations, chi-squared and Fisher's Exact (when appropriate) tests were conducted. All data were analyzed using SAS software version 9.4 (Cary, NC) and p-values <.05 were regarded as statistically significant.

Results

A total of 144 participants completed the questionnaire with 23% of participants identifying as NELP with origins in fifteen different countries. The majority of participants identified as Caucasian or Black or African American with smaller percentages of individuals identifying as other ethnicities. The demographic data obtained serves as a good representation of the larger community served by the community health center according to the most recent census data. Participants who identified as NELP listed the following languages as their first language: Spanish, Swahili, Kinyarwanda, Yoruba, Arabic, French, Hindi, Japanese, Kanga, Masalit, Telegu, Turkish, and Vietnamese. Additionally, 16 of the NELP participants reported being in the United States for less than ten years, while 17 of these participants reported being in the United States for more than ten years. Table 1 summarizes the key demographic information of the survey participants.

Comparing the perceptions of COVID-19 and the COVID-19 vaccines between ELP and NELP patients

NELP individuals were significantly less likely to believe that their cultural needs had been met throughout this pandemic when compared to ELP individuals (p = .037). However, they were more likely to believe they were well informed about COVID-19 (p = .025), trust the information the government released regarding the COVID-19 vaccines (p < 0.001), trust information about the COVID-19 vaccines from their healthcare providers (p = .043), and believe the government had ensured their safety throughout the pandemic (p = .005). Additionally, NELP individuals were significantly more likely to feel that social distancing could help reduce the spread of the COVID-19 virus (p = .028) and feel that everyone should be vaccinated against COVID-19 (p = .002). Individuals with ELP were significantly more concerned about the financial burden contracting COVID-19 could produce (p = .043). Of note, all participants felt that COVID-19 is a serious problem with over 90% agreement in each group and both groups felt that personally contracting COVID-19 would cause a serious illness with over 80% agreement in each group. These findings along with additional information are depicted in Table 2.

Comparing health literacy, sources of information, and trusted/preferred sources between ELP and NELP participants

On average individuals who identified as NELP could only correctly identify 6.39 of the fifteen possible COVID-19 symptoms compared to ELP patients who could correctly identify on average 9.21 COVID-19

Table 1. Comparison of participant demographic information between patients with *English* language preference (ELP) and non-*English* language preference (NELP) (N = 144).

	ELP (N = 111)		NELP (N = 33)	
Average Age (Standard Deviation)	46.2 years (15.9)		47.9 years (20.0)	
Age Range	18 to Over 75		18 to Over 75	
Questions/Statements	Positive Response	Percent	Positive Response	Percent
Male	28	25.23	18	54.55
Female	82	73.87	15	45.45
Caucasian	43	38.74	<5	-
African American/Black	70	63.06	15	45.45
Hispanic/Latino	<5	-	7	21.21
Other Ethnicity	<5	-	8	24.24
Less than High School Degree	8	7.21	7	21.21
High School Degree	44	39.64	9	27.27
Associates Degree or Trade School	28	25.23	5	15.15
Bachelor's Degree	15	13.51	6	18.18
Graduate Degree	16	14.41	5	15.15
Single	56	50.45	8	24.24
Married/Life Partner	42	37.84	24	72.73
Employed or Student Full-Time	37	33.33	8	24.24
Employed Part-Time	11	9.91	<5	-
Unemployed Seeking Employment	8	7.21	<5	-
Unable to Work	21	18.92	<5	-
Retired/Not Seeking Employment	28	25.23	15	45.45
Have No Children	63	56.76	12	36.36
Have 1–2 Children	28	25.23	7	21.21
Have 3 or More Children	19	17.12	12	36.36
Completed Survey at Follow-up Visit	53	47.75	20	60.61
Completed Survey at Vaccine Clinic	46	41.44	11	33.33
Completed Survey at Home via QR Code	12	10.81	<5	-

Positive responses indicate those who answered yes to the question or agreed with the statement compared to the total number of responses within each group. Answers with <5 positive responses were masked and do not include percentages to ensure participant privacy.

Table 2. Comparison of perceptions about COVID-19 and the COVID-19 vaccines between those with *English* language preference (ELP) and non-*English* language preference (NELP) (N = 144).

	ELP (N = 111)		NELP (N = 33)		
Questions/Statements	Positive Response	Percent	Positive Response	Percent	P-value
COVID-19 is a serious problem	100	90.09	31	93.94	0.267
If I caught COVID-19 it would be serious	93	83.78	27	81.82	0.981
COVID-19 would cause a financial burden	72	64.86	26	78.79	0.043 *
I feel well informed about COVID-19	84	75.68	30	90.91	0.025*
I can access information on COVID-19	102	91.89	29	87.88	0.820
A family member contracting COVID-19 concerns me	71	63.96	22	66.67	0.617
COVID-19 has affected my mental health	55	49.55	16	48.48	0.964
The COVID-19 vaccine works	70	63.06	26	78.79	0.054
Everyone should be vaccinated	63	56.76	28	84.85	0.002 *
I wish to receive the COVID-19 vaccine	66	59.46	25	75.76	0.053
I encourage family/friends to get the COVID-19 vaccine	66	59.46	25	75.76	0.053
Wearing masks limits the spread of COVID-19	91	81.98	30	90.91	0.104
Social distancing limits the spread of COVID-19	96	86.49	32	96.97	0.028 *
Handwashing limits the spread of COVID-19	106	95.50	32	96.97	0.222
The government has ensured my safety during the pandemic	68	61.26	28	84.85	0.005 *
I believe the government about the COVID-19 vaccine	58	52.25	30	90.91	<0.001 *
I believe my doctor about COVID-19 vaccines	85	76.58	30	90.91	0.043 *
My cultural needs have been met	104	93.69	24	72.73	0.037 *

Positive responses indicate those who answered yes to the question or agreed with the statement compared to the total number of responses within each group. Statistical significance is determined by a p-value ≤.05 and is indicated by an asterisk.

symptoms (p = .048). The NELP participants were less likely to identify fever (p = .031), cough (p = .019), nausea/vomiting (p = .021), fatigue (p = .015), chills (p = .002), body aches (p = .002), and shortness of breath (p = .027) as COVID-19 symptoms compared to their ELP counterparts. Of note, identification of loss of taste or smell as a symptom of COVID-19 was identified by only 48.48% of those with NELP which is significantly less than ELP individuals at 79.28% (p < .001). We used correct symptom identification as a gauge of health literacy for COVID-19 since it is critical to identifying individuals at risk of having the condition. Table 3 depicts the differences between the identification of possible COVID-19 symptoms between these two groups.

Although television or radio were the most common methods of information obtainment, those with NELP were significantly less likely to gain information from the state governing agencies (p = .009) or their healthcare professionals (p = .004) compared to ELP patients. Participants from both groups trusted healthcare professionals the most

Table 3. Comparison of Possible COVID-19 symptoms between those with English language preference (ELP) and non-English language preference (NELP) (N = 144).

Someone diagnosed with COVID-19 may experience which of the following?	ELP (N = 111)		NELP (N = 33)		
	Positive Response	Percent	Positive Response	Percent	P-value
Fever	93	83.78	22	66.67	0.031*
Cough	84	75.68	18	54.55	0.019*
Headache	82	73.87	19	57.58	0.073
Loss of taste or smell	88	79.28	16	48.48	<0.001*
Nausea/Vomiting	59	53.15	10	30.30	0.021*
Fatigue	82	73.87	17	51.52	0.015*
Malaise	39	35.14	11	33.33	0.849
Chills	71	63.96	11	33.33	0.002*
Muscle or Body Aches	85	76.58	16	48.48	0.002*
Sore Throat	57	51.35	11	33.33	0.069
Diarrhea	47	42.34	9	27.27	0.119
Shortness of Breath/Difficulty Breathing	80	72.07	17	51.52	0.027*
Stuffy Nose/Congestion	45	40.54	8	24.24	0.088
Chest Pain	48	43.24	12	26.26	0.482
Loss of Appetite	62	55.86	14	42.42	0.175

Positive responses indicate those who answered yes to the question or agreed with the statement compared to the total number of responses within each group. Statistical significance is determined by a p-value ≤.05 and is indicated by an asterisk.

Table 4. Comparison of health information obtainment and trusted sources between those with English Language Preference (ELP) and Non-English Language Preference (NELP) (N = 144).

Questions/Statements	ELP (N = 111)		NELP (N = 33)		
	Positive Response	Percent	Positive Response	Percent	P-value
I learned about COVID-19 from a healthcare professional	75	67.57	13	39.39	0.004 *
I learned about COVID-19 from Governing State Agencies	48	43.24	6	18.18	0.009 *
I learned about COVID-19 from TV/Radio	84	75.68	18	54.55	0.019 *
I learned about COVID-19 from social media	51	45.95	11	33.33	0.199
I trust healthcare professionals	92	82.88	25	75.76	0.357
I trust Governing State Agencies	43	38.74	16	48.48	0.318
I trust TV/Radio	20	18.02	10	30.30	0.127
I trust social media	9	8.11	5	15.15	0.231
I would prefer to receive COVID-19 information by mailed handouts	27	24.32	12	36.36	0.110
I would prefer to receive COVID-19 information by e-mail	28	25.23	<5	-	0.060
I would prefer to receive COVID-19 information by phone calls	8	7.21	7	21.21	0.020*
I would prefer to receive COVID-19 information by internet postings	30	27.03	6	18.18	0.390
I would prefer to receive COVID-19 information by other	15	13.51	<5	-	0.290

Positive responses indicate those who answered yes to the question or agreed with the statement compared to the total number of responses within each group. Statistical significance is determined by a p-value ≤.05 and is indicated by an asterisk. Answers with <5 positive responses were masked and do not include percentages to ensure participant privacy.

with agreement over 75% of the time. Interestingly, although most of their information was obtained from television or radio, only 30% of NELP patients and 18% of ELP participants trust the healthcare information from these sources. There was a wide variety in the preferred method to receive important health information going forward, and the top three methods differed between these two groups. The NELP population preferred translated mailed handouts, followed by phone calls in their preferred language, and translated internet postings from trusted sources. The ELP population preferred internet posting from trusted sources the most, followed by emailed handouts and mailed handouts. Table 4 highlights some of these differences.

Comparing safety measures taken by those with ELP and NELP

One-third of the individuals identifying as NELP had received one dose of the COVID-19 vaccine at the time of the survey and 24.24% had received the second dose. Comparatively, these percentages were 49.55% and 34.23% respectively for the ELP group. The majority of participants from both groups reduced time in public and reduced the number of social gatherings they attend, increased handwashing practices, and wore masks in public places. There were no statistically significant differences between either group. Table 5 provides additional information.

Discussion

This study aimed to gain insight into the health literacy, perceptions of COVID-19, perceptions of the COVID-19 vaccines, and preferences for obtaining medical information from those with NELP and see how they differ from those with ELP. Although NELP individuals were 21% less likely to feel their cultural needs had been met throughout this pandemic, they overwhelmingly agreed that the government had ensured their safety. They felt that they were well informed about COVID-19 and were more trusting of information released by healthcare professionals and governmental agencies about the COVID-19 vaccines. However, on average, the NELP group was able to identify three fewer COVID-19 symptoms and recognized the loss of taste or smell as a symptom over

Table 5. Comparison of protective methods implemented between those with English language preference (ELP) and non-English language preference (NELP) (N = 144).

Questions/Statements	ELP (N = 111)		NELP (N = 33)		
	Positive Response	Percent	Positive Response	Percent	P-value
I have reduced time in public places	94	84.68	30	90.91	0.087
I have reduced the number of social gatherings I attend	99	89.19	30	90.91	0.444
I have increased the amount of handwashing	97	87.39	30	90.91	0.314
I wear a mask in public	104	93.69	32	96.97	0.145
Received first COVID-19 vaccine	55	49.55	11	33.33	0.129
Received second COVID-19 vaccine	38	34.23	8	24.24	0.534

Positive responses indicate those who answered yes to the question or agreed with the statement compared to the total number of responses within each group. Statistical significance is determined by a p-value ≤.05 and is indicated by an asterisk.

30% less than their ELP counterparts. This points to absent or reduced access to health information due to the numerous barriers to care we have previously discussed, or to reduced understanding, possibly due to language barriers. This is further reinforced by the finding that the NELP group was 28% less likely to obtain information from a healthcare professional. Although some of these findings are encouraging for the role local governmental agencies, community primary care, and public health professionals play in individual and community health education, they also emphasize the need for continued improvement in the way we deliver healthcare to these individuals in order to help mitigate the health disparities they face while seeking culturally-sensitive care. Although numerous factors could contribute to this discrepancy, maneuvering the healthcare system in a non-preferred language remains difficult, despite availability of interpretation services at point of care and online translation materials. Even though television and radio were the most used source of information about COVID-19, healthcare professionals were overwhelmingly the most trusted source in both groups and yet NELP participants were less likely to receive this information from their provider. Over one year into this pandemic, less than half of NELP participants and only 60% of ELP participants could correctly identify seven or more possible symptoms of COVID-19 from a list of symptoms, including the hallmark symptom of loss of taste or smell. Whether this lack of background knowledge arose from reduced access or reduced understanding, it could impact the ability of these groups to recognize symptoms, appropriately follow pandemic protocols, or delay treatment which could lead to a worse prognosis or increase utilization of acute services such as emergency departments. This can add strain and frustration to both the patient and the healthcare system. Differences between ELP and NELP patients in our study provide additional evidence to the studies mentioned previously [6,9,11,15], and identify specific areas where meaningful intervention can be developed. Trust-building and providing access to accurate medical information are ongoing processes for all patients, but especially important for immigrant and refugee populations due to the additional barriers they face.

This study also identified a significant amount of mistrust among the ELP participants. Only 63% of these individuals felt the COVID-19 vaccines work and less than 60% of these individuals wish to receive the vaccine, feel everyone should be vaccinated, or would encourage their family members to be vaccinated. This feeling of mistrust is further expanded upon by the findings that 61% of ELP participants felt the government ensured their safety throughout the pandemic, 52% believe the government about the COVID-19 vaccine, and less than 40% trust governing state agencies. Amongst the NELP participants the only statement that indicated considerable mistrust was in governing state agencies where they trusted them only 48% of the time. Although we did not investigate the cause of this mistrust, it is rather prevalent and must be taken into account whenever COVID-19 or the COVID-19 vaccines are being discussed with a patient.

One reassuring conclusion is that over 84% of all participants had implemented the utilization of masks, increased handwashing, reduced time in public, and reduced the number of social gatherings they attended. Potential implications of this study include local clinics and health systems providing NELP patients with health information through their preferred modalities, such as mailed handouts, telephone calls in their preferred language, and translated internet postings from trusted sources. For ELP patients, disseminating this information through trusted internet postings, e-mails, and mailed handouts. This would allow for important and factual information to be disseminated quickly to individuals of the community. This study also reinforces the need for collaboration between global, national, and local health systems to provide what all patients want and trust most, time with their healthcare provider to receive high quality health education and reinforce best care practices.

Limitations

This survey was administered 11 months into the pandemic after some of the initial language access issues had been addressed by national agencies and local public health offices. Despite this timing, we were able to expose important knowledge gaps in COVID-

19 symptomology and access to this information. This study was only conducted at one FQHC in a Midwestern United States city. The data are closely tied to this community and may vary in other regions. Our sample comprised of 111 ELP participants and 33 NELP participants, potentially introducing increased variance due to the small sample size and unequal groupings. Some selection bias could be introduced due to convenience sampling as 39.6% of the respondents completed the survey while they were attending the vaccine clinic hosted by the FQHC. The wording of the survey questions may reflect some bias on the part of the authors, particularly with respect to trust in healthcare or government, which could have prompted socially desirable responding on the part of study participants [34]. In addition, NELP respondents were comprised of a heterogenous mix of ethnicities, languages, and countries of origin that were not individually analyzed for the purposes of this report. During survey administration, we did not have live oral interpretation available for NELP patients who did not have written literacy in their primary language. Therefore, we could only collect what these individuals could express in written language rather than what they may truly feel, which means we may have missed important data and feedback in their preferred language.

Conclusions

In the setting of a United States based community health center serving a global patient population, this small pilot study demonstrates key differences between ELP and NELP patients with regard to pandemic perceptions, knowledge, and preferences. It also exhibits research inclusion of a heterogenous representation of NELP patients often found to be absent or excluded as study participants in the general community health literature due to additional IRB and process barriers to reach these populations [35,36]. There are well known barriers to improving healthcare disparities, including insurance coverage and cost of language access, underutilized interpretation services, limited providers and resources in underserved areas, and the difficulty of developing or implementing a generalized culturally-sensitive care model [37,38]. By surveying NELP individuals, we learned a wealth of information that can be used to create culturally-sensitive, targeted resources accessible at point of care to quickly intervene and address disparate health information and education locally. Continued and expanded research of NELP individuals or other vulnerable populations across the country would create local, state, national, and global partnerships which would be able to evaluate the efficiency, efficacy, and equality within the medical system and continue to improve the disparate care these populations receive. The resources created should focus on the development of trustworthy, widely translated materials that can be used to disseminate information very quickly when another health crisis occurs. Additionally, this work can also improve our ability to offer health information and education on standards of health promotion, prevention, and chronic disease management for these patients. Healthcare providers were trusted by the vast majority of participants within this study and should be intimately tied to these educational materials to further instill trust and reliability within these communities. Turning globally available health education material into locally relevant resources is also an important next step for all healthcare communities, including the important step of NELP patients getting a chance to be a part of the creation and feedback process. Promoting collaborative processes between healthcare professionals and the communities they serve, including NELP patients, can improve the dissemination of accurate information and advance the overall health for all those within these communities [39].

Abbreviations

ELP: English language preference;
NELP: non-English language preference;
CDC: Centers for Disease Control and Prevention;
FQHC: Federally Qualified Health Center

Ethical Approval and Consent to participate

This study was submitted and approved by Wright State University's Institutional Review Board (IRB #: SC6006, OHRP #: IRB00000034) prior to study initiation. Once approved, participants consented to the survey and publication of deidentified information.

Consent for Publication

All authors consented to publication

Availability of Data

Most data generated from this study are included in the published article, remaining data are available from the corresponding author on reasonable request.

Disclosure statement

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All authors read and approved the final manuscript

CE: Study design, analysis, interpretation of data, drafted the work, substantively revised work, correspondence

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TC: Analysis, interpretation of data, substantively revised work

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