An Analysis of Publicly Available Health Education Materials Designed for Migrant Farm Workers

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INTRODUCTION

In the United States, more than 3 million migrant or seasonal farm workers are employed in agriculture each year (Wilson, 2012). The lack of legal protections, low pay, and often-dangerous work conditions lead to serious health inequities for farmworkers and their families. Prior research has identified farm work as one of the most dangerous occupations. Risk of pesticide exposure is high, and extreme heat exposure and suboptimal living situations have been documented (Damalas, 2016). Exacerbating these structural problems are barriers to health care, including health literacy. Health literacy, following the Center for Disease Control and Prevention's definition is "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (CDC, 2021).

Materials and safety trainings for farmworkers are often limited by language, literacy level, and cultural appropriateness. The National Academy of Medicine found over 300 studies documenting that health information is presented in too difficult language for the general population (Graham, 2008). With 80% of all farmworkers having limited literacy in Spanish or English (Arcury, 2010), understanding health resources can be a challenge. For example, only 6% of all physicians in the United States are able to speak conversational Spanish (Abuelo, 2020). Community health workers thus have assumed a critical role. A farmworker health outreach worker or community health worker is a, "frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community" (Cacal, 2019). Farmworker health outreach workers typically share "…ethnicity, language, socio-economic status, and life experiences" with the

people they serve. Their core responsibility includes providing culturally competent health education to farmworkers. Farmworker health outreach workers identify labor camps, visit labor camps, provide health education and enabling services (e.g., transportation to health centers, interpretation).

To assist efforts to improve health literacy for farmworkers, we sought to (1) ask community health workers what barriers they have when identifying health education materials for farmworkers, (2) identify and assess materials being used by outreach workers, health centers, and community organizations, and (3) examine the availability of health education materials for farmworkers in four databases. While these databases often offer a plethora of health education materials for the general public, often the migrant farmworker population falls to the wayside, being underrepresented although they make up a significant portion of the United States population. This project sought to examine four major health education material databases and determine how much of the content is catered to the migrant farmworker demographic. By analyzing each of the databases, our hope was to document the percentage of materials that are targeted towards migrant farmworkers within these databases, determine where disparities lie within the health education materials and propose possible methods of bridging the gap in available knowledge and materials.

METHODS

We conducted this research as part of a National Library of Medicine Health Disparities Resources Grant (G08LM013198), which included a partnership with a state farmworker health program and an advisory board that included students from farmworker families, community health workers, health education specialists, and librarian/information science specialists. First, we conducted focus groups with farmworker outreach coordinators workers in western and

central North Carolina. Second, we systematically searched and solicited materials for farmworker health education, including from researchers, listservs, and outreach staff. We then assessed these materials using the Patient Educational Materials Assessment Tool (PEMAT). Third, we examined the availability of materials on farmworker health topics across four national databases of health information: MedlinePlus, Migrant Clinicians Network, National Agricultural Safety Database, and National Center for Farmworker Health.

In order to address these aims, we selected health education topics of importance to farmworker health. We used a state farmworker health program enabling services encounter form to identify 15 health education topics, we refined the list based on input from our Advisory Board and partners. This resulted in 15 health education topics. We then separately conducted a mapping review of the farmworker that identified research topics in farmworker health literature. Before we could begin searching the databases for the determined topics however, first the topics needed to be defined and synonyms for each of the 15 topics were added in order to get the most accurate search results within the data bases before research would begin.

The four databases that were chosen to be coded and examined were Medline Plus, the National Agriculture Safety Database, Migrant Clinicians Network, and the National Center for Farmworker Health. These four databases were determined to be the most prominent in when it comes to Farm Worker Health literature by an advisory panel. From there, the data points that were going to be captured needed to be determined.

A total of fifteen of the most relevant and occurring topics were determined by a systematic mapping review and advisory panel in order to most accurately gauge the availability of information in these databases. In order to get the most encompassing results when searching the databases for these terms, our team first laid out the definition of what health education

materials would be counted for each of the fifteen topics. This also would include a list of the most common synonyms for each of the fifteen topics as well, so that verbiage would not be an issue in this research. For example, Dental Care would also include Oral Health, as it is just another way to frame the topic.

Once all of these synonyms were properly defined, it was then time to begin formulating the code book for the fifteen topics across the four databases. The first datapoint that was captured in the codebook was the database that the specific search was conducted on, as well as which topic was searched in that particular instance. The next major data point that would need to be captured was if each particular health education material was deemed targeted in nature. Targeted materials for this project include any materials that use surface or deep structural approaches in order to target farmworkers and their families.

We developed a coding protocol, which is available in our institutional repository. To establish inter-rater reliability, we piloted coding, revised the protocol, and then three independent coders used the coding protocol to identify the number of materials and farmworker-specific materials in the four databases using two topics, immunizations and oral health. This coding test was done to ensure coding on the status of targeted materials was statistically accurate before mass coding was completed. We calculated reliability using Krippendorff's alpha, and we achieved adequate reliability: alpha = 0.85 (95% confidence interval 0.70 – 0.96).

Once reliability was established, we coding the remainder of the fifteen key topics. All four databases were coded from October 2020 to December 2020, with a link to each individual health education material logged being captured within the database for future reference capabilities in case of changing availability. After each of these datapoints were coded and

logged, the total number of materials for each database on each topic was summated as well as the number of targeted materials for both each topic and each database as a whole.

After combing through thousands of unique data points, there were many different trends that were able to be dissected from all of the entry points found. What we first examined in the databases was the total number of materials found for each of the 15 individual health education topics, both by topic as a whole, as well as topics in each database as shown in Table 1.

Table 1. Health education materials for farmworker health topics in four databases, October - December 2020

Topic	**MedlinePlus**		**NASD**		**MCN**		**NCFH**	
	n	% targeted	*n*	% targeted	*n*	% targeted	*n*	% targeted
Alcohol, Tobacco & Other Drugs	38	0%	3	0%	3	-	6	0%
Clinic Services	1	0%	0	-	0	-	0	-
Dental Care / Oral Care	7	0%	1	0%	3	0%	7	43%
Diabetes	37	0%	2	0%	2	0%	4	75%
Emergency Preparedness	2	50%	1	100%	3	100%	2	100%
Emotional / Mental Health	12	0%	7	43%	2	0%	7	14%
Green Tobacco Sickness	1	0%	3	0%	0	-	0	-
Heat & Sun Safety	4	0%	17	23%	7	86%	3	33%
HIV / AIDS / STIs	17	0%	0	-	7	0%	4	0%
Immunizations	12	0%	1	100%	2	0%	0	-
Living Conditions / Sanitation	0	0%	4	25%	0	-	12	42%
Nutrition	21	0%	1	0%	6	0%	0	-
Pesticides	6	0%	19	11%	16	44%	1	100%
Safety & Injury Prevention	11	0%	2	50%	4	100%	5	100%
Sexual Harassment & Domestic Violence	3	0%	2	0%	8	88%	2	0%

Notes: NASD = National Agricultural Safety Database; MCN= Migrant Clinicians Network; NCFH= National Center for Farmworker Health. Targeted indicates

The topic with the most unique health education materials available to the public was alcohol, tobacco and other drugs, with 50 materials meeting the coding criteria in order to be counted towards a topic. Not far behind this topic in terms of total materials found was diabetes, with 47 materials found across the 4 different data bases. On the other end of the spectrum, a

topic such as emergency preparedness had very few materials found across the four different farmworker health databases, with only eight total materials being found.

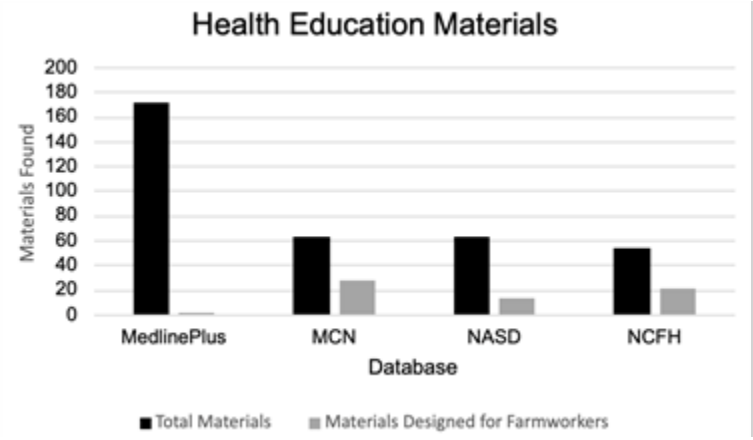
Regarding materials designed specifically for farmworkers, on average just 25.92% of materials on these topics were specific to farmworker populations. While these topics were some of the most readily available in terms of health education materials, they ranked on the bottom end in terms of materials targeted. For example, with alcohol, tobacco and other drugs having 0% of all materials found be classified as designed towards migrant farmworkers and their families, and diabetes materials only having less than 9% of materials be targeted.

On the other end of the spectrum, a topic such as emergency preparedness had very few materials found across the four different farmworker health databases, with only eight total materials being found, it emergency preparedness, with few materials overall, had by far one of the highest rates of materials targeted, with 87.5% of materials being coded as targeted towards farmworkers and their families.

Another interesting trend that was very relevant in our data to look at was the number of materials found according to specific databases (Figure 1). MedlinePlus, one of the most prominent databases in the health education field had 172 total materials found on the 15 different topics being examined. While this was by far the most materials out of any database, only one of the materials on the whole database were coded as targeted in nature, coming out to a total of 0.58% materials targeted. The Migrant Clinicians Network and the National Agriculture Safety Database each ended up having 63 materials pertaining to the 15 different topics. While this is only roughly a third of the materials found on the Migrant Clinicians Network, these databases had vastly higher percentages of materials targeted, with Migrant Clinicians Network having 42.9% targeted and National Agricultural Safety Database having 20.6% targeted. The

National Center for Farmworker Health also was very informative, having 53 materials across the 15 topics, 39.6% of which were coded as targeted.

Figure 1. Health education materials for farmworker health topics in four databases, October - December 2020



DISCUSSION

Principal Findings

After all of the data points were captured and examined across the 4 databases, it was apparent that while MedlinePlus had the most raw data available, it lacked in targeted information for migrant farmworkers. Other databases, while not having the same scope of general knowledge, flourished when it came to materials designed for farmworkers, with databases such as Migrant Clinicians Network having upwards of 43% materials designed specifically for farmworkers.

Results in Context

In order to have the most equitable health care system possible, there needs to be enough publicly available health care materials on the internet to assist a patient that cannot afford to go to a care provider. There are many people that are not capable of going regularly or even as needed to a health care provider, especially within the migrant farm worker community. Many of

these farm workers and their families rely on health outreach workers for their health care information. These outreach workers in turn use databases such as MedlinePlus and Migrant Clinicians Network for accurate health information and tools.

After examining the databases, it is clear to see that materials are not often designed with migrant farmworkers in mind, even though they make up an important population of underrepresented patients. A trend that was constant across all databases was outdated materials. This included many links that were dead, meaning that once clicked they went no where, as well as outdated modes of dissemination such as comic books and pamphlets rather than an internet program that could more easily be utilized in this society.

While three of the four databases that were examined are designed with farm workers in mind, it was surprising to see the lack of materials that was coded as truly designed for farm workers. Unlike similar research projects, this project set out to see materials that were designed with farm workers in mind, not just those of Hispanic descent.

Strengths and Limitations

While it is imperative that health education materials be available online for those that are in search of it, what is more imperative is that those who are commonly underrepresented receive equitable treatment in their health care. With farm workers making up such a large population in the United States each year, the field of public health must take it upon themselves to ensure the farm worker community receives information that is designed for their unique living situation. One of the biggest strengths of this project was that researchers were effectively able to see just how big of a representation gap exists within the farmworker health community. Where this research lacks though is in an executable solution to such a vast problem.

Conclusion

With migrant farmworkers in the United States being an essential part of our food system, researchers and clinicians must take it upon themselves to ensure there is equitable representation in health education materials available. There are many situations that arise on a farm that seldom are seen in laymen education materials, and one giant problem that can arise from this is that when a farm worker finally needs to find information on their health, insufficient data will be found, resulting in ailment. With only 24.9% of all materials found on targeted databases truly being designed for farmworkers, there is an obvious disparity in representation for the farm worker work force in the very materials for farmworkers. With the addition of more targeted materials, as well as materials that are already created being uploaded onto a publicly available database, the field of public health might soon be able to close the gap, alleviating such a consequential problem, and working towards the goal that all clinicians and researchers have; equitable health care.

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