Journal of Racial and Ethnic Health Disparities (2022) 9:1882–1887
https://doi.org/10.1007/s40615-021-01125-1

The Association Between Education and Basic Needs Insecurity for Marshallese During the COVID-19 Pandemic

Jennifer A. Andersen[1] · Don E. Willis[1] · Joseph R. Malhis[1] · Christopher R. Long[1] · Pearl A. McElfish[1]

Received: 7 June 2021 / Revised: 29 July 2021 / Accepted: 29 July 2021 / Published online: 17 August 2021

Abstract

Background The purpose of this study was to explore the prevalence of basic needs insecurity and to examine the association between education and basic needs insecurity during the COVID-19 pandemic for Marshallese living in the USA.

Methods Survey data describing Marshallese experiences during the pandemic were analyzed using descriptive statistics and complementary log–log regression to test the association between education and basic needs insecurity.

Results Marshallese respondents reported no usual source of care (46%), less healthcare (22.3%), and difficulty obtaining medication (34.8%). Nearly 80% reported being food insecure, and 47.5% reported being housing insecure. Marshallese with a high school education or less had higher odds of reporting being food and housing insecure.

Discussion Basic needs insecurities are a serious threat to the health of Marshallese during the pandemic. Results from this study can inform interventions addressing food and housing insecurity, access to healthcare, and medication access for Marshallese communities.

Keywords Marshallese · Basic needs · COVID-19 · Education · Food and housing insecurity

Background

The first cases of COVID-19 were diagnosed in the USA in early 2020 [1]. The subsequent pandemic disproportionally burdened racial and ethnic minority groups in the USA. For example, in Benton and Washington Counties in Arkansas, home to the largest population of Marshallese in the continental USA, Marshallese people represent approximately 2.5% of the total population but made up 19% of the COVID-19 cases [2]. Between March and June of 2020, 9% of COVID-19-positive Marshallese in these Arkansas counties was hospitalized for COVID-related complications compared to just 1% of all COVID-19-positive cases nationally. Marshallese accounted for 38% of COVID-19 deaths in Benton and Washington counties during that same period [2]. Marshallese living in other states in the USA were equally hard hit by COVID-19 [3]. For example, Marshallese in Spokane County, Washington account for 1% of the county's population but represent a third of the county's COVID-19 cases [4].

Fundamental cause theory posits that socioeconomic status (SES) is a fundamental cause of health disparities [5]. SES represents access to a number of resources, including money, knowledge, prestige, power, and advantageous social connections that work to protect health regardless of the historical context [5]. Education is an important component of SES for which health gradients have been observed [5, 6]. Education is considered a fundamental cause in part because credentials provide opportunities to secure higher-status occupations which, in turn, provide advantages both in terms of access to more resources as well as less involvement in conditions which might expose someone to hazards [6].

Prior to the pandemic, Marshallese people experienced widespread social and health disparities [7, 8]. Limited access to healthcare, food insecurity, and housing insecurity are all associated with a wide range of negative health outcomes including asthma, diabetes, poor self-rated health, overweight/obesity, and poor mental health [9, 10]. Although much has been written about healthcare disparities and growing food insecurity across the USA since the pandemic began [11], no research to date has explored the

✉ Pearl A. McElfish
PAMcelfish@uams.edu

[1] College of Medicine, University of Arkansas for Medical Sciences Northwest, 1125 N. College Avenue, Fayetteville, AR 72703, USA

social and health disparities among Marshallese during this unique economic and public health crisis.

Following calls to view COVID-19 as a syndemic—a set of interconnected and interacting health problems that co-contribute to excess disease in a population [12, 13]—we explore the prevalence of basic needs insecurity among an understudied population of Marshallese living in the continental USA and Hawaii and examine the association between education and healthcare access, food insecurity, and housing insecurity.

Methods

Participants and Data Collection

Community-based recruitment was completed via e-mail, Facebook, and phone calls from Marshallese community health workers. Inclusion criteria specified participants be self-reported Marshallese living in the continental USA and Hawaii and at least 18 years of age. Recruitment took place from July 27, 2020, to November 22, 2020. All study information was provided in English and Marshallese. Consent and survey data were documented in Research Electronic Data Capture (REDCap), a web-based software designed for research and data collection and management. The survey utilized a Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) feature to prevent fraudulent responses. Participants received a $20 gift card if they completed the survey.

Measures

Questions from the Behavioral Risk Factor Surveillance System captured demographic information [14]. Questions from the PhenX toolkit were used to ask other COVID-19 questions [15]. Variables of interest were dichotomized (yes/no) and included the following: (1) had a regular source of care; (2) obtained less healthcare during COVID-19; (3) difficulty obtaining needed medications during COVID-19; (4) food insecurity during COVID-19; and (5) housing insecurity during COVID-19. Housing instability was defined as self-reported difficulty in paying rent, mortgage, or utility bills in the past year. Food insecurity was defined by an affirmative response to either of two questions asking if, during the COVID-19 pandemic, the respondent (1) worried that their food would run out before they had money to buy more or (2) the food that the respondent bought did not last and they did not have the money to buy more. The main independent variable of interest, education, was a categorical variable of high school or less, some college or a technical degree, and a bachelor's degree or higher. Dichotomous variables for sex (male/female), time in the USA (< 10 years/10 years or more), and English proficiency (proficient/not proficient), as well as a continuous variable for age, were used to control for differences in demographic characteristics and level of acculturation.

Analysis

Descriptive statistics were calculated to characterize the sample and responses to survey questions, with means and standard deviations for continuous variables and the frequency and percentages for categorical variables. Complementary log–log regression was used to determine the prevalence ratio (PR) of the variables of interest. Analysis was completed using STATA 16 [16], and a p value of 0.05 or less was considered statistically significant.

The study was approved by the Institutional Review Board at the University of Arkansas for Medical Sciences (Protocol #261131).

Results

A total of 120 individuals living in 12 states responded to the survey. States represented include Arizona, Arkansas, California, Hawaii, Michigan, Missouri, Nevada, Oklahoma, Oregon, Tennessee, Texas, and Washington. We do not include the number of respondents in each state due to small cell sizes in order to protect the identity of the participants. Table 1 presents the descriptive statistics for the sample. The mean age of the sample was 35.5 years (± 8.8). One-third (35.8%) of the sample were male, and 38.7% of the sample had a high school education or less. Two-thirds (66.1%) of the sample reported living in the USA for more than 10 years, and the majority of the sample were English proficient (88.3%). Forty-six percent reported not having a usual source of care, 22.3%

Table 1 Participant characteristics

	Mean(StD) or *n* (%)
Age in years ($n = 120$)	35.5 (± 8.8)
Male ($n = 120$)	43 (35.8)
Time in USA > 10 years ($n = 118$)	78 (66.1)
English proficient ($n = 120$)	106 (88.3)
Education ($n = 119$)	
High school or less	46 (38.7)
Some college or tech degree	47 (39.5)
Bachelor's degree or more	26 (21.8)
No regular source of care ($n = 111$)	51 (46.0)
Obtained less healthcare ($n = 112$)	25 (22.3)
Difficulty obtaining medications ($n = 112$)	39 (34.8)
Food insecure ($n = 120$)	88 (79.3)
Housing insecure ($n = 120$)	57 (47.5)

reported obtaining less healthcare during the pandemic, and 34.8% reported difficulty obtaining needed medication during the pandemic. Nearly 80% of the sample reported being food insecure, and 47.5% reported being housing insecure.

Table 2 reports the results of the complementary log–log regressions by education only and education with the control variables. For education alone, Marshallese with a high school education or less were less likely to report having a regular source of care (*PR* = 0.40, 95% CI [0.20, 0.80]) compared to those with a bachelor's degree or more. Marshallese with a high school education or less (*PR* = 0.30, 95% CI [0.11, 0.78]) or some college or a technical degree (*PR* = 0.36, 95% CI [0.14, 0.92]) were less likely to report receiving less healthcare during the pandemic compared to those with a bachelor's degree or more. Marshallese with a high school education or less (*PR* = 0.32, 95% CI [0.15, 0.73]) or some college or a technical degree (*PR* = 0.45, 95% CI [0.21, 0.96]) were less likely to report difficulty obtaining needed medications during the COVID-19 pandemic compared to those with a bachelor's degree or more.

With the addition of the demographic controls, Marshallese with lower levels of education continued to be less likely to report having a regular source of care, as well as less likely to report receiving less healthcare or difficulty obtaining needed medication during the pandemic compared to those with a bachelor's degree or more. As age increased, Marshallese were more likely to report having a usual source of care (*PR* = 1.08, 95% CI [1.04, 1.12]). Marshallese who reported not speaking English well were also more likely to report having difficulty obtaining needed medications compared to those who were English proficient (*PR* = 4.61, 95% CI [1.76, 12.10]).

Table 3 presents the results of the complementary log–log regressions for food and housing insecurity. For the model with education only, Marshallese who had a high school education or less were more likely to report they were food insecure (*PR* = 2.71, 95% CI [2.37, 5.36]) and housing insecure (*PR* = 3.37, 95% CI [1.46, 7.74]) during the COVID-19 pandemic, compared to those with greater than a high school education. With the addition of the demographic controls, the associations remained significant with Marshallese with a high school education or less being more likely to report food insecurity (*PR* = 2.62, 95% CI [1.27, 5.41]) and housing insecurity (*PR* = 3.56, 95% CI [1.50, 8.42]). No other statistically significant associations were found.

Discussion

The aim of this paper was to explore the prevalence of basic needs insecurity among an understudied population of Marshallese and to examine the association between education and healthcare access, food insecurity, and housing

Table 2 Binomial and multivariable complementary log–log regression with prevalence ratios: relationship between education and access to care

	Have a regular source of care								**Received less healthcare**								**Difficulty obtaining needed medication during COVID-19**							
	Education only ($n = 110$)				Education and demographics ($n = 109$)				Education only ($n = 111$)				Education and demographics ($n = 109$)				Education only ($n = 111$)				Education and demographics ($n = 109$)			
	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*
Education (ref = bachelor's or higher)																								
High school or less	.40	.14	.20, .80	**.009**	.23	.10	.10, .55	**.001**	.30	.15	.11, .78	**.014**	.24	.13	.08, .71	**.009**	.32	.13	.15, .73	**.007**	.19	.10	.08, .52	**.001**
Some college or tech degree	.57	.19	.30, 1.09	.087	.54	.20	.26, 1.14	.105	.36	.17	.14, .92	**.033**	.30	.15	.11, .81	**.017**	.45	.17	.21, .96	**.038**	.38	.16	.17, .85	**.018**
Age (in years)					1.08	.02	1.04, 1.12	**<.001**					.99	.02	.94, 1.04	.717					.99	.02	.95, 1.03	.537
Male					.64	.21	.34, 1.21	.172					.52	.24	.21, 1.29	.163					.64	.23	.32, 1.29	.216
Time in the USA < 10 years					.85	.26	.46, 1.57	.613					1.04	.46	.44, 2.48	.914					1.60	.57	.81, 3.20	.177
Not English proficient					1.02	.52	.38, 2.76	.958					1.91	1.30	.51, 7.23	.337					4.61	2.27	1.76, 12.10	**.002**

Note: *PR* prevalence ratio, *SE* standard error, *CI* confidence interval. *P* values less than .05 are in bold

Table 3 Binomial and multivariable complementary log–log regression with prevalence ratios: relationship between education and food and housing insecurity

	Food insecurity								**Housing insecurity**							
	Education only ($n=110$)				Education and demographics ($n=109$)				Education only ($n=119$)				Education and demographics ($n=117$)			
	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*	PR	SE	95% CI	*p*	PR	StE	95% CI	*p*
Education (ref = bachelor's or higher)																
High school or less	2.71	.94	2.37, 5.36	**.004**	2.62	.97	1.27, 5.41	**.009**	3.37	1.43	1.46, 7.74	**.004**	3.56	1.57	1.50, 8.42	**.004**
Some college or tech degree	1.63	.56	.83, 3.20	.154	1.56	.55	.78, 3.11	.208	1.65	.73	.69, 3.94	.259	1.79	.81	.73, 4.36	.201
Age (in years)					1.00	.01	.98, 1.03	.830					1.10	.02	.97, 1.04	.698
Male					.79	.21	.46. 1.34	.378					1.03	.30	.58, 1.84	.919
Time in the USA < 10 years					.92	.25	.54, 1.57	.769					1.29	.38	.72, 2.28	.391
Not English proficient					.83	.35	.36, 1.90	.658					.93	.38	.47, 2.08	..863

Note: *PR* prevalence ratio, *SE* standard error, *CI* confidence interval. *P* values less than .05 are in bold

insecurity. In the present study, we find large percentages of Marshallese adults report no regular source of care (46.0%), obtaining less healthcare (22.3%), and difficulty obtaining medications (34.8%) during the pandemic. The percentage of Marshallese without a usual source of care is higher than estimates reported for other racial/ethnic minorities prior to the COVID-19 pandemic [17]. Further, more Marshallese reported difficulty obtaining healthcare and medications than reported for Native Hawaiians and Pacific Islanders (NHPIs) prior to and during the COVID-19 pandemic [17, 18].

Marshallese with a high school education or less were less likely to report having a regular source of care. Surprisingly, they were also less likely to report receiving less healthcare and difficulty obtaining medications compared to those with a bachelor's degree or more. Although the lower odds of reporting difficulties with accessing healthcare and medications seems counterintuitive, the lower odds of having a source of care may help to explain these results. If one does not have a usual source of care, receiving little to no healthcare and having minimal need to fill medications may be the standard. Therefore, in comparison to before the pandemic, little has changed. For example, the data used for this analysis also showed Marshallese with a high school education or less reported fewer doctor visits in 2019 (1.68 ± 3.57) compared to those with a bachelor's degree or more (2.10 ± 3.55).

Marshallese individuals are allowed to live and work as "legal non-immigrants" in the USA because of the Compact of Free Association (COFA) agreement between the Republic of the Marshall Islands and the USA, but many migrant Marshallese have low incomes and lack health insurance [19, 20]. Despite a promise by the USA to provide healthcare to the Marshallese in return for the damages caused by the nuclear testing in the Republic of the Marshall Islands in the 1940s and 1950s, Marshallese COFA migrants were barred from accessing Medicaid in 1996 [21–24]. However, access to Medicaid was restored for Marshallese COFA migrants with the passage of the Consolidated Appropriations Act in December of 2020 [23], and future research will need to evaluate the change in healthcare access once Medicaid access data is available.

Nearly half of Marshallese adults report housing insecurity, and close to four in five report food insecurity. The high rate of food and housing insecurity reported by respondents is especially concerning given the sample reported higher levels of education than in previous studies of Marshallese [25, 26]. Material hardships in terms of food and housing needs have risen during the pandemic [27]. The prevalence of food insecurity in the USA since the pandemic began has been estimated to have more than doubled [11, 28]. Although food insecurity and housing insecurity have risen in all populations and especially in racial and ethnic minority populations, the prevalence among this sample

of Marshallese Pacific Islanders is much higher than has been documented in other populations [29]. Baseline estimates for food and housing insecurity among Marshallese in the USA are not well-documented, making it difficult to fully grasp how much these hardships may have increased. Among NHPIs in the USA, the best estimates suggest one in five adults were food insecure prior to the pandemic [30]. Among Marshallese adolescents, some estimates have found that over half report some level of food insecurity [8]. Both pre-pandemic estimates for NHPIs, although much higher than the national average, are substantially lower than the prevalence we find among this sample of Marshallese during the pandemic.

In the context of a global pandemic, these basic needs insecurities present serious threats to the health of the Marshallese, who are already disproportionately vulnerable to COVID-19. Insecure access to these basic needs represents a set of social conditions which continue to disproportionately place Marshallese at risk of health disparities. Consistent with fundamental cause theory, education appeared to have a protective effect against these basic needs insecurities. For example, Marshallese who reported higher levels of education were less likely to report food and housing insecurity than those with a high school degree or less. Additionally, Marshallese with a high school education or less reported fewer doctor visits in 2019 than those with higher levels of education.

The results of the study should be considered with limitations in mind. The study used a small sample of Marshallese living in the USA, and the education level of the sample was higher than other published demographics for Marshallese [25, 26]. Further, the data is cross-sectional, and healthcare access and food/housing insecurity may have changed rapidly during the pandemic.

New Contribution to the Literature

Despite these limitations, the study makes a significant contribution to the literature. Although other studies have documented similar findings qualitatively [31, 32], this article is the first to quantitatively document healthcare and basic needs access for Marshallese adults living in the USA during the COVID-19 pandemic. This is particularly important given the health disparities experienced by Marshallese. Ensuring access to healthcare, food, and housing are key to living a healthy life, and our results show there is much work left to do to ensure equitable access to basic needs for Marshallese living in the USA. The results from this study were used to implement a collaborative intervention to address food insecurity and housing insecurity through enhanced case management and food box delivery programs for quarantined and isolated families. The study results were also used to implement a collaborative intervention to provide health education (e.g. sick day protocols for those with diabetes) and to ensure access to healthcare and medication. A description of those programs has been published in the *Journal of Hunger & Environmental Nutrition* [33] and *Preventing Chronic Disease* [34].

Author contribution PAM acquired the data; JAA, DEW, and PAM conceived of the study and participated in the design of the study; JAA and DEW analyzed and interpreted the data; JAA, DEW, and CRL drafted the manuscript. All authors revised the manuscript for important intellectual content and approved the final version of the manuscript.

Funding The work was supported by the Patient Centered Outcomes Research Institute (PCORI) under grant #AD-1603–34602 and the Translational Research Institute (TRI) under grant #U54 TR001629 through the National Center for Advancing Translational Sciences (NCATS) of the National Institutes of Health (NIH). The content is solely the responsibility of the authors and does not necessarily represent the official views of the PCORI or NIH. In addition, the research was supported by the Arkansas Coalition of Marshallese, Marshallese Education Initiative, Marshallese Consulate office in Springdale, Arkansas, and West Hawaii Community Health Center.

Availability of data and materials Not applicable.

Code availability Analysis was completed using STATA 16.

Declarations

Ethics approval The study was approved by the Institutional Review Board at University of Arkansas for Medical Sciences (Protocol #261131).

Consent to participate Consent and survey data were documented in Research Electronic Data Capture (REDCap), a web-based software designed for research and data collection and management.

Consent for publication Not applicable.

Conflict of interest The authors declare no competing interest.

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