HHS Public Access

Author manuscript

Cancer Causes Control. Author manuscript; available in PMC 2024 August 10.

Published in final edited form as:

Cancer Causes Control. 2022 October ; 33(10): 1295–1304. doi:10.1007/s10552-022-01612-8.

Predictors of Cervical Cancer Screening for Refugee Women[1] Attending an International Family Medicine Clinic in the United States

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[1]As research scientists, we authors are aware of the need to be more inclusive in our language describing sexual and gender identities of study subjects and participants[1]. At the time of data collection for this study, the Electronic Medical Record (EMR) in use only offered a binary option (male or female) for indicating sex and/or gender. Therefore, the sample is comprised of individuals whose sex was identified as female in the EMR. We are not aware that any individuals in the sample identified as a non-binary or transgender person, nor was this detail explicitly examined when data collection was done in 2018.

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Authors' contributions

CEE contributed to the conception of the study; collecting, cleaning, and analyzing the data; and drafting the manuscript. EMM contributed to the conception of the study, provided advice and direction for the study design and data interpretation, and verified a random sub-set for accuracy of the outcome variable. KD, JKM and KL provided advice and direction for the study design and data interpretation. KOT contributed to the conception of the study; and collecting and cleaning the data. FRH contributed to the conception of the study, and provided advice and direction for the study design and data interpretation. All authors revised the article critically for important intellectual content, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Conflicts of interest/Competing interests

The authors have no conflicts of interest to disclose.

Availability of data and material

The deidentified dataset generated and analyzed during the current study are available from the corresponding author on reasonable request, after review by the Institutional Review Board and through a Data Use Agreement.

Code availability

Stata/IC 16.1 was used to analyze this data, and code is available from the corresponding author on reasonable request.

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Abstract

Purpose—Cervical cancer screening (CCS) rates are lower for foreign-born women in the United States compared with the overall population. This study aimed to determine the CCS rate and predictors among refugees who were identified as female attending a family medicine clinic.

Methods—A retrospective chart review included refugee individuals ages 21+, seen in the previous 3 years (3/23/2015 – 3/20/2018), without hysterectomy (n=525). Lab results determined CCS rate. Chi square and logistic regression models explored predictors of CCS.

Results—Overall, 60.0% were up-to-date (UTD) on CCS. Individuals ages 30-49, married, and with ≥1 child had higher odds of being UTD. Ten or more years living in the U.S. was a significant bivariate predictor of CCS, and approached significance in the multivariate model.

Conclusion—This study begins to fill gaps in knowledge about cervical cancer control among individuals who resettled in the U.S. as refugees and, given that CCS rates are suboptimal, informs clinical practice improvements and directions for future research.

Keywords

cervix cancer; cancer screening; refugees; healthcare disparities

Purpose

Worldwide, cervical cancer is the fourth most commonly diagnosed type of cancer and cause of cancer-related death in women[2]. Increasing the proportion of individuals living in the United States (U.S.) who participate in cervical cancer screening (CCS) from 80.7% [3] to an overall rate of 93.0% is one of the key objectives of *Healthy People 2020*[4]. Analysis of National Health Interview Survey (NHIS) data identified predictors that lead to disparities in CCS for individuals generally[5]. Notably, those in the youngest (21–29) and oldest (40–49 and 50–65) age groups had significantly lower odds of being screened for cervical cancer, as did those with less than a college education, with family income <400% of the poverty level, not having a usual source of health care, and having either Medicaid or other public insurance, or being uninsured [5].

NHIS data also show that foreign-born women are more than twice as likely to have *never* had a Pap test, and to have not had a Pap test in the past 3 years, compared to U.S. born women[6]. Indeed, CCS rate for foreign-born women are persistently and significantly lower [7, 8], specifically for those living in the U.S. for less than 10 years (66% [61.5-70.1 95% CI]) [9], and for non-citizens who have lived in the U.S. for less than 5 years (OR = 0.65 [0.54-0.78]) [10].

A 2019 systematic review that examined facilitators and barriers to breast and CCS among immigrant women living in the U.S. identified relevant factors on every level of the social-ecological model (SEM) including: lack of knowledge, fear of embarrassment, fear of pain, or fear of positive diagnosis (individual factors); lack of provider recommendation, provider gender mis-match, providers who are insensitive to cultural or religious beliefs (interpersonal factors); lack of language interpreters, lack of clinic based outreach to under-screened people (organizational factors); limited access to affordable health care options (community factors); and lack of health insurance (policy factors) [11]. These factors include or are derived from upstream factors – social determinants of health – that cross multiple levels of the SEM [12, 13]. Some factors may be unique to the immigrant experience, such as language concordance or acculturation in their new communities. We recognize immigration itself as a social determinant of health [14]. Other factors may be unique to the experience of refugee people in particular, such as having lived in a refugee camp, or having experienced specific traumas which forced them to flee their home country to seek asylum and eventually achieve refugee status [15].

Refugees are a specific type of foreign-born person living in the United States. This legal status is defined by the United Nations High Commissioner for Refugees (UNHCR) as any person who has been forced to flee their country of origin because of persecution, war or violence for reasons of race, religion, nationality, political opinion or membership in a particular social group [16]. As one part of federal resettlement support, adult refugees in the United States are eligible to receive 8 months of public health insurance (Refugee Medical Assistance) upon arrival [17]. An estimated 1.6 million female refugees have resettled in the U.S. since 1975 [15]; however, relatively few studies have examined factors that predict CCS adherence specifically for refugees living in the U.S. The objectives of this study are to determine the overall CCS rate and to explore predictors of CCS among a sample of refugees who were identified as female attending an international family medicine clinic in Central Virginia. This will allow us to identify whether a disparity in CCS exists for these individuals compared to the overall U.S. population, and will inform directions for clinical practice and future research.

Methods

We conducted a retrospective electronic medical record (EMR) review to determine the rate and predictors of CCS among individuals identified as female attending an international family medicine clinic (hereafter referred to as “the Clinic”) in Central Virginia. The Clinic is located at an academic medical center and has served over 3,800 refugees and special immigrant visa holders (hereafter referred to collectively as “refugees”) from over 60 countries since it was established in 2002 [18]. All refugees who resettle in the area are referred by the local refugee resettlement agency to establish care at the Clinic, and close to 100% attend at least one initial visit. This research study was approved by the Human Subjects Research Institutional Review Board (HSR-IRB) of the University of Virginia on May 22, 2018 (HSR-IRB #20724).

Sample

Data were collected for individuals identified as female who had arrived in the U.S. as refugees, were ages 21 or older at the time of EMR review and had been seen by a provider in the Clinic in the past 3 years (n= 547). The Clinic considers those seen at least once in the past 3 years to be current patients of the practice; dates of last clinic visit for the sample ranged from 3/23/2015 to 3/20/2018. Cases were excluded if there was evidence of hysterectomy (n=22), resulting in a total of 525 cases that met all inclusion criteria.

Data Collection

Eligible subjects were identified using an IRB approved database previously established for the Clinic to identify participants for research in this population. The data extracted from the database included demographic variables, and these were exported as a csv file. Additional data collected from EMR review were manually added to the csv file.

Measures

Dependent variable—The outcome of interest was whether or not an individual was up-to-date (UTD) on CCS as of the date of study initiation. UTD refers to those who are eligible for CCS and have received screening within the recommended time interval, at a given point in time (specifically, as of the date of IRB approval – May 22, 2018) [19]. This is a binary outcome (yes/no), based on the 2012 U.S. Preventative Services Task Force (USPSTF) guidelines for CCS, which were current at the time of study approval [20]. Specifically, the 2012 USPSTF guidelines recommended that individuals between 21 and 65 years of age be screened every 3 years with a cytology (Papanicolaou or Pap) test, while individuals between the age of 30 and 65 had the alternative option for co-testing – meaning a combination of Pap testing plus human papillomavirus (Pap+HPV) testing – every 5 years. Raw data collected included: date of birth, date of last CCS, and the type(s) and result(s) of the last screening test(s). New variables were created that calculated the individual's age at time of screening; indicated the result of a Pap test and/or HPV test; and counted the number of negative tests. A series of "if, then, else" expressions were used in Microsoft Excel to determine the appropriate screening interval based on age and type of testing (3 years for Pap alone, 5 years for Pap+HPV). A new variable was created that calculated whether the time interval since date of last CCS to May 22, 2018 was *less than* the recommended screening interval. If so, then the case was coded as being "UTD" on CCS.

Every case with any abnormal screening result (n=29) was reviewed individually. Screening intervals were adjusted based on American College of Obstetricians and Gynecologists (AGOG) guidelines appropriate for abnormal results [21]. A second study team member verified 10% of all cases to determine agreement (100%) of UTD status.

Independent variables—Countries of origin and primary languages are summarized as frequencies and percentages, while current age and years lived in the U.S. are continuous variables summarized by means and standard deviations (SD). Independent variables used as potential predictors include: current age by 10-year groups (limited by the youngest and oldest ages in the screening guidelines), marital status, religion, literacy in their primary language, completion of secondary school, number of children, years lived in the U.S.

(categorical variable based on previous studies [9, 10]), percentage of lifetime lived in the U.S., ability to speak English as either a primary or secondary language, whether one has ever lived in a refugee camp and history of trauma. These data were self-reported by patients and summarized qualitatively by encounter providers. Definitions and variable type, including details about recoding unstructured data is described in Online Resource 1.

Analysis

Univariate descriptive statistics, cross tabulations and pairwise correlations were calculated. Bivariate relationships between all independent variables and the outcome variable were analyzed using Pearson's Chi-square, with an alpha of 0.05. Multivariate logistic regression results are reported in adjusted Odds Ratios (aOR), with 95% confidence intervals (CI). Data were analyzed using Stata I/C version 16.1, using robust standard errors [22].

Results

Demographic Characteristics

The mean age of the sample was 41.2 years (SD 14.9, range 21 – 89). Mean years living in the U.S. was 6.1 (SD 3.96, range <1 – 20 years). There were 32 unique countries of origin represented in the sample; the top 8 countries represent ~82% of the sample; after that each country of origin was represented by fewer than 10 individuals. The 10 most frequent languages represent 85% of the sample; 43 languages were represented. These data are summarized in Table 1.

Overall CCS Rate and Bivariate Analysis

Overall, 60% (315 of 525) of individuals were UTD on CCS. Cross tabulations and bivariate relationships between each independent variable and the outcome are reported using Pearson's Chi-square analysis (Table 2). There were significant differences in the outcome related to age group, marital status, having at least one child, and number of years lived in the U.S.

Correlations and Missingness

Years lived in the U.S. and percentage of life lived in the U.S. were strongly correlated (r= .85) when examined as continuous variables. Given this, only years lived in the U.S. was retained as a categorical variable in the multivariate models, aligning with previously published literature [9, 10]. Pairwise correlations between other variables were <.49.

Of the 12 independent variables, 9 variables had some missing data, ranging from <1% to 51.43% (as shown in Table 2). Five independent variables (i.e., religion, literacy, completion of secondary school, lived in refugee camp and history of trauma) were removed from the multivariate models due to excessive missing data. Using the <mi> command in Stata, multiple imputation (m=25) with chained equations was used to account for independent variables with less than ~10% of missing data [23, 24]. Missing data were assumed to be missing completely at random. The missingness of independent variables is not dependent on the outcome variable, and all model variables were included in the imputation procedure, including the outcome variable which had no missing data [25].

Multivariate Logistic Regression Models

Multivariate logistic regression models were run, first using only cases with complete data (n=432, Model 1), and then using multiple imputation (MI) with chained equations (n=525, Model 2); robust standard errors were used for both models. There was consistency in terms of magnitude, direction and significance of each predictor when comparing complete case versus MI model. While controlling for all other variables, the models consistently showed that individuals in the 30-49, and 40-49 age groups had statistically higher odds of being UTD on CCS compared to the youngest age group. Having ever been married and having had at least once child doubled the odds of an individual being UTD on CCS, compared to individuals who were never married or had no children. We found that years lived in the U.S. was a significant predictor in the bivariate model; in the multivariate model, it approached significance for the group of individuals who had lived in the U.S. for ≥10 years, while controlling for all other variables. Table 3 shows both models side by side.

Discussion

Only 60% of individuals were UTD on CCS, compared to 80.7% in the U.S. overall, demonstrating a disparity in CCS uptake for the sample. Further, this study found that several known predictors of CCS were also found for the refugees in our sample, including being between 30 and 50 years old, being married and having at least once child. These findings of increased odds of being UTD with these age groups [5], having ever been married and having at least one child [26] is consistent with other published literature.

Given our clinical experiences with this population, other findings from this exploratory analysis of predictors are worth further discussion, particularly given the rarity of refugee-specific analysis on CCS in the U.S.

We had hypothesized that religion would be a significant predictor. Our clinical experience suggests that many younger individuals who practice Islam often decline CCS before marriage, when they state that they are not sexually active. In this sample, we found that 61.8% of Muslim individuals (the largest religious group represented) were UTD on CCS, which is statistically equivalent to the sample's overall rate of 60.0%. However, an unexpected finding was that individuals who practice Buddhism had a lower percentage of being UTD (43.9%, found in Table 2). In post-hoc analysis, we found no significant differences in marital status or mean age, or percentage of life lived in the U.S. across religious groups in our sample. Some have suggested that the more acculturated individuals are to the country of resettlement, the less significant religion is as a factor in CCS uptake [26]. International studies have shown that Buddhist individuals have higher CCS rates compared to individuals practicing other religions [27, 28]. One U.S.-based study of Cambodian-American women suggested that while Buddhism itself was not a predictor of ever- or recent- CCS, Buddhist beliefs that illness is a matter of karma could play a role in decisions to participate in CCS and other preventative care [29]. These mixed findings suggest that particular attitudes and beliefs of diverse sub-groups generally, and of patients as unique individuals, are important factors to be assessed in clinical settings, and that more research is needed to better understand differences among refugee persons who practice different religions.

In another population-based study, the researchers found increased odds of reporting a Pap test within the past 3 years if the period of residence in the U.S. was ≥10 years [30]. In the present study, we found that while years lived in the U.S. was a significant predictor in the bivariate model, in the multivariate models, it approached significance for the group of individuals who had lived in the U.S. for ≥10 years. This is a clinically relevant finding, explained by the fact that individuals who have lived longer in a country of resettlement may be more established in their jobs and thus may be more likely to have health insurance or afford care, and may have had more opportunities to be offered screening, particularly for individuals who stay attached to the same usual source of care for a long period of time.

Though closely correlated with years lived in the U.S., percentage of lifetime lived in the U.S. was not a significant factor in the bivariate analysis. While number of years or percentage of lifetime living in the U.S. has sometimes been used as a proxy for acculturation [31], future prospective studies should use validated measures for acculturation to assess whether this is a significant factor for refugee individuals [32].

We hypothesized that individuals who reported a history of direct trauma related to their refugee status would have lower rates of CCD adherence; however, we found that 69.3% of those who reported direct trauma were UTD on CCS, which is statistically equivalent to the overall proportion of the sample (see Table 2). While extant literature on associations between violence against women and CCS is mixed [33], one provider who cares for individuals in the Clinic has observed an eagerness to pursue screenings as they seek reassurance that their past trauma will not put them at risk for future physical morbidities (R. Thompson, personal communication, March 3, 2020). However, given the high percentage of missing data for this variable, that the trauma data were non-specific and not structured, and that the proportion was not statistically different from the overall sample, we relay this information to clinicians and researchers alike with caution.

Strengths and Limitations

Analyses of retrospective data from EMRs have inherent limitations, in particular the inability to control data collection and inevitable missing data. We also recognize the bias inherent to imputation of missing data; though, here we have used principled methods, reported key settings used in the statistical software, specified a sufficient m, and reported the MI model alongside the complete case model [25, 34]. We believe there is merit to disseminating this exploratory data analysis, in particular because the data represent a population that is generally difficult to identify in other population-based data sources[35], and because there is scant data related to CCS for refugees living in the United States. In this dataset, EMR data were lacking for some factors with known influence on CCS uptake, among them: household income; employment status; current health insurance status; and knowledge, attitudes, beliefs about CC and CCS.

This analysis was strengthened by the fact that we used EMR data to determine the outcome variable for all included cases. Details about screening tests and results came directly from the medical record which means that determining the outcome variable did not rely on participant recall [19]. However, it is possible that individuals in the sample may have received testing elsewhere (for example, young people who have moved away for college)

which means that our findings may have underestimated the proportion of people in the Clinic's population who are UTD. Conversely, our sample included only people who have actively sought medical care in our Clinic in the past 3 years, which may bias the overall rate of being UTD on CCS upward.

While screening intervals could potentially impact completion rates, in this study, we considered whether cases were UTD as of a given point in time – the study's IRB approval date. So, if a case last had Pap+HPV and the time interval from last test to IRB approval date was <5 years, or if the case had only Pap testing and the time interval from last test to IRB approval was <3 years, then the case was coded as UTD; the same logic was used for Pap only testing with a 3 year interval. We provide secondary analysis of UTD status by screening type/interval for our sample in the supplemental file (Online Resource 2).

We excluded cases with history of hysterectomy, which has been shown by Beavis and colleagues [36], to provide more reasonable estimates of CCS adherence. However, we found that the data extracted from the EMR about surgical history was limited because most of the documented hysterectomies had been completed prior to the patients seeking care in the Clinic, including those reportedly done overseas. In some cases, individuals with a hysterectomy should continue being screened with cytology [21], so when possible, providers should have access to clear records about how much of the cervix was removed and whether indications for the surgery were benign or not, in order to ensure appropriate preventative care.

There are cultural nuances across countries of origin and language that are difficult to capture in quantitative analysis, and we recognize these limitations. For example, the life experiences of young people born in a refugee camp in Nepal would likely have been different from those of their parents, who were born in Bhutan, and therefore should be considered separately. For people from Afghanistan, age and speaking Pashto or Dari may suggest differences in socio-economic status or educational opportunities in their home country. For reasons like these, and because there were so many countries of origin represented in the sample, we did not include country level variables in the regression models.

Factors related to countries of origin, including the existence and type of CCS programs, percentage of population covered by programs where they exist, the type of CCS tests used, and existence of HPV vaccination programs for primary prevention, would all be potentially relevant factors for people who have arrived in the U.S. as refugees. In a separate analysis related to this study, we found the large majority come from low-resource countries that do not have effective national cervical cancer control programs that include either primary prevention through HPV vaccination or secondary prevention through screening [37]. Because of this, it is essential for providers to anticipate that refugee patients of any age have neither been vaccinated nor screened. Additionally, they should assess their refugee and foreign-born patients individually for history of HPV immunization and CCS, and knowledge, attitudes and beliefs about preventative care more generally; and plan to implement evidenced-based preventative care strategies accordingly.

Finally, the Clinic's patient population is unique and reflects trends in refugee resettlement in our particular city, while in different parts of the country, the diversity of residents who arrived as refugees may look quite different. Therefore, these results may not be generalizable to groups of people who arrive as refugees in other parts of the U.S. or to individuals who were not otherwise represented by the sample.

New Contribution to the Literature

This study contributes to existing knowledge by using an established refugee clinic database to examine CCS rates for female-identifying refugees living in the U.S. To our knowledge, this study represents the largest sample of refugee people residing in the U.S. that examines the question of CCS adherence using clinical laboratory results, and explores demographic variables as potential predictors of uptake. The findings suggest that individuals in the sample are similar to U.S.-born individuals in terms of predictors of CCS adherence: being between 30 and 50 years old, married, and having at least one child all increase adherence. Living in the U.S. for less than 10 years potentially decreases the odds that an individual was UTD on CCS. Healthcare providers should be aware that in most refugee countries of origin neither HPV vaccination nor CCS is widely available, and focused attention should be paid particularly to younger (<30 years), unmarried, child-less, and older (>50 years) refugee people who have lived in the U.S. less than 10 years.

Most of the variables explored in this data are individual, non-modifiable risk factors. In other qualitative analysis from this dataset, we found that providers in this Clinic are recommending screening, and are considering cultural preferences by offering screening by female providers [38]; this should be continued. Providers should also consider how the delivery of culturally specific health education around both CCS and HPV vaccination could improve cervical cancer control for this population into the future [39]. In our Clinic, an initiative to provide culturally sensitive education around colon cancer screening, utilizing the role of a Registered Nurse as educator and advocate and a specially made video in the target audience's primary language, has bolstered successful colon cancer screening completion for refugees. A similar strategy may also improve both CCS and HPV vaccination uptake.

The National Academy of Medicine and the National Institute on Minority Health and Health Disparities have issued calls for researchers to produce knowledge that can inform our understanding of risk and protective factors for unique sub-groups of the population living in the United States, and to seek and implement context specific approaches to address disparities in care for affected sub-groups [40, 41]. There are certainly knowledge gaps about immigrants in general in the U.S., but for refugees in particular, there are very few datasets that allow researchers to uniquely identify refugees, particular when it comes to assessing cancer control measures [35]. There is also the need for more research focused on understanding barriers and facilitators to CCS for refugees. This exploratory study lays the groundwork for additional mixed method research focused on understanding particular barriers and facilitators which are unique to refugee populations and sub-populations living in the United States, with the eventual goal of developing tailored interventions that will decrease disparities in screening.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgement:

Preliminary findings from this study were presented at the North American Primary Care Research Group Annual Conference, Toronto, November 2019.

Funding

A portion of Dr. Elmore's time spent revising this manuscript for publication was supported by the National Institute of Nursing Research of the National Institutes of Health under Award Number T32NR013456. The content is solely the responsibility of the authors and does not necessarily represent the official view of the National Institutes of Health.

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Table 1

Demographics including age, years lived in U.S. and 10 most frequent countries of origin and language

	Mean (SD)	Min	Max		Mean (SD)	Min	Max
Age	**41.2 (14.92)**	**21**	**89**	**Years in U.S.**	**6.1 (3.96)**	**0**	**20.5**
Countries of Origin (Top 10)	**Frequency**	**%**	**Cum. %**	**Primary Languages (Top 10)**	**Frequency**	**%**	**Cum. %**
Afghanistan	130	24.8	24.8	Nepali	129	24.6	24.6
Bhutan	109	20.8	45.6	Arabic	94	17.9	42.5
Iraq	73	13.9	59.5	Dari	74	14.1	56.6
Congo	35	6.7	66.2	English	34	6.5	63.1
Burma	33	6.3	72.5	Farsi (Persian)	27	5.1	68.2
Nepal	20	3.8	76.3	Swahili	25	4.8	73
Syria	18	3.4	79.7	Pashto	20	3.8	76.8
Colombia	11	2.1	81.8	Burmese	16	3.1	79.9
Iran	9	1.7	83.5	Russian	16	3.1	83
Russia	9	1.7	85.2	Karen	13	2.5	85.5

Note. SD = Standard Deviation. Individuals who report a country of origin of either Bhutan or Nepal are ethnically Bhutanese, and spent time living in refugee camps in Nepal. Dari and Pashto speakers are from Afghanistan, and Burmese and Karen speakers are from Burma.

Table 2

Cervical cancer screening adherence by independent variable (percentages and Pearson χ^2)

	n	Yes (%)	No (%)	χ^2
Age Group				46.12*
21-29	136	**42.6**	57.4	
30-39	142	73.9	26.1	
40-49	112	73.2	26.8	
50-59	63	60.3	39.7	
60-65	25	**56.0**	44.0	
>65	47	**38.3**	61.7	
Marital Status				36.13*
Never Married	145	**39.3**	60.7	
Married/Widowed/Divorced	376	68.1	31.9	
Missing (%)	4 (0.8)			
Religion				
Muslim	178	61.8	38.2	7.24
Christian	83	62.7	37.3	
None	63	65.1	34.9	
Buddhist	41	**43.9**	56.1	
Other	23	73.9	26.1	
Missing (%)	137 (26.1)			
Literacy in Primary Language				0.91
Not literate	79	**54.4**	45.6	
Literate	176	60.8	39.2	
Missing (%)	270 (51.4)			
Completed Secondary School				0.24
No	202	61.4	38.6	
Yes	148	**58.8**	41.2	
Missing (%)	175 (33.3)			
Number of Children				33.24*
No children	72	**30.6**	69.4	
1 or more children	395	66.6	33.4	
Missing (%)	58 (11.1)			
Years lived in U.S.				11.52**
≤ 1 year	20	**50.0**	50.0	
1-5 years	206	64.1	35.9	
6-10 years	176	**54.6**	45.4	
>10 years	77	75.3	24.7	
Missing (%)	46 (8.8)			
Percentage of lifetime lived in U.S.				0.09
< 25%	384	61.5	38.5	

	n	Yes (%)	No (%)	χ^2
≥ 25%	95	63.2	36.8	
Missing (%)	46 (8.8)			
English as primary or secondary language				0.00
No	415	60.0	40.0	
Yes	110	60.0	40.0	
Ever lived in a refugee camp				3.58
No	88	75.0	25.0	
Yes	172	63.4	36.6	
Missing (%)	265 (50.5)			
History of Trauma				4.18
Denied	166	**58.4**	41.6	
Indirect	19	**52.6**	47.4	
Direct	114	69.3	30.7	
Missing (%)	226 (43.1)			

Note. *$p < 0.001$, **p < 0.01

Percentages in **bold** are less than the overall percentage for the sample.

Table 3.

Logistic Regression Models Showing Odds Ratios of being Up-to-Date on Cervical Cancer Screening.

	Model 1		Model 2	
	aOR	**95% CI**	**aOR**	**95% CI**
Age Group				
21-29	1.00		1.00	
30-39	2.99**	[1.65, 5.44]	2.84**	[1.66, 4.84]
40-49	2.70**	[1.38, 5.30]	2.53**	[1.39, 4.16]
50-59	1.45	[0.70, 3.02]	1.49	[0.76, 2.89]
60-65	1.86	[0.59, 5.79]	1.54	[0.59, 3.96]
>65	0.91	[0.36, 2.27]	0.79	[0.36, 1.73]
Ever married				
No	1.00		1.00	
Yes (Married / Divorced / Widowed)	2.20**	[1.26, 3.84]	2.04**	[1.25, 3.36]
Having at least one child				
No	1.00		1.00	
Yes	2.42*	[1.22, 4.78]	2.34*	[1.22, 452]
Years lived in U.S.				
≤ 1 year	1.00		1.00	
1-5 years	2.30	[0.71, 7.44]	2.33	[0.86, 6.28]
6-10 years	1.28	[0.39, 4.20]	1.49	[0.53, 4.14]
>10 years	2.89	[0.78, 10.75]	3.15*	[1.01, 9.78]
Speaks English as primary or secondary language				
No	1.00		1.00	
Yes	1.22	[0.67, 2.24]	1.12	[0.68, 1.86]

Note. Model 1 uses complete cases (n=432). Model 2 uses Multiple Imputation (m=25) with chained equations and Robust Standard Errors. aOR = Adjusted Odds Ratio, CI = Confidence Interval, *p<0.05. **p<0.01. aORs control for all other covariates in each model.