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Depressive symptoms among resettled Bhutanese older adults in Ohio: a cross-sectional study

Isha Karmacharya[1], Bunsi Chapadia[2], Aman Shrestha[3], Janardan Subedi[1], Uday Narayan Yadav[4,5], Sabuj Kanti Mistry[6,7] and Saruna Ghimire[1*]

Abstract

Background There has been growing attention given to the mental health challenges faced by older adult populations, particularly among resettled refugee communities. Among these groups, the prevalence of depressive symptoms often remains high due to a multitude of factors associated with displacement, trauma, and acculturation stress. Since 2008, Bhutanese refugees have been resettled in the United States, making them one of the largest refugees in the country. However, mental health issues often remain obscured for this demographic, as they are typically subsumed within largely heterogeneous Asian populations. This study aimed to determine depression symptoms in resettled Bhutanese older adults and analyze the associated factors.

Methods Snowball sampling was used to collect data from 276 55+-year-old adults in Ohio from January to June 2022. The questionnaire covered demographics, lifestyle, social support, life satisfaction, chronic disease, and depression. Binary logistic regression assessed the associations between associated factors and depressive symptoms.

Results and Conclusions Approximately one-third (31.8%) of the participants had depressive symptoms. Factors associated with lower odds of having depressive symptoms included better self-reported health, strong social support, life satisfaction, and high resilience. Individuals with chronic diseases were more likely to have depressive symptoms. The high percentage of depressive symptoms among resettled Bhutanese older adults emphasizes the need for a supportive environment in the host country, ensuring access to resources, and comprehensive and tailored interventions to address their mental health needs.

Keywords Bhutanese, Older adults, Refugees, Depression, Depressive symptoms

*Correspondence:
Saruna Ghimire
saruna.ghimire@miamioh.edu
[1]Department of Sociology and Gerontology and Scripps Gerontology Center, Miami University, Oxford, OH, USA
[2]Department of Microbiology, Miami University, Oxford, OH, USA
[3]Division of Gerontology, School of Medicine, University of Maryland Baltimore & University of Maryland Baltimore County, Baltimore, MD, USA
[4]National Centre for Epidemiology and Population Health, The Australian National University, Canberra, Australia
[5]International Centre for Future Health System, University of New South Wales, Sydney, Australia
[6]School of Population Health, University of New South Wales, Sydney, Australia
[7]Department of Public Health, Daffodil International University, Dhaka, Bangladesh

Introduction

Since the implementation of the Refugee Act in 1980, the United States has granted refuge to more than 3.8 million individuals categorized as refugees and asylees [1]. Recent data suggest that more than 18,000 new refugees from around the world are resettled annually in the United States [2]. Among the largest group of populations of resettled refugees in the United States over the past few decades were the Bhutanese refugees [3–5]. They constitute the third largest refugee population group, accounting for 13% of all refugee populations in the United States, followed by Myanmar (21%) and Iraq (18%) [5].

The Bhutanese refugees, also known as Lhotshampas, are ethnic Nepalis from southern Bhutan who fled due to the "ethnic cleansing" initiated by the Bhutanese monarchy through the "One Nation, One People" policy in 1985 [6]. This policy aimed to promote the dominant Drukpa culture and homogenize Bhutan to the detriment of the Lhotshampa population [7]. Noncompliance with the policy, which prohibited the use of the Nepali language and Hindu cultural practices, resulted in penalties and, in some cases, imprisonment. This led to the forced displacement of approximately one-sixth of Bhutan's population to refugee camps in southeast Nepal [8].

After spending nearly two decades in these refugee camps, most of them found new homes in other countries through a resettlement program initiated in 2007 [4]. Over 100,000 Bhutanese refugees have been resettled in various countries, with approximately 85% resettling in the United States. Initially, the highest concentrations of Bhutanese refugees in the United States were in Pennsylvania, Texas, and New York [3]. However, in recent years, many relocated to Ohio because of the large preexisting Bhutanese-Nepali community [9], establishing it as the state with the largest Bhutanese population outside Bhutan [10]. Census data on their population are aggregated with other Asian groups, so the exact official number is unavailable. However, local Bhutanese organizations estimate that there are more than 50,000 resettled Bhutanese individuals in Ohio (27,000 in Columbus [6], 12,000 in Cincinnati [9], 7600 in Cleveland [11], and 5000 in Akron [12]).

The processes of forced displacement, seeking refuge, resettlement, and acculturation are inherently stressful, significantly increasing vulnerability to mental health challenges among refugee populations [13]. Specifically, Bhutanese refugees have previously endured traumatic experiences, including atrocities, psychological torture, rape, murder, the sudden loss of relatives, property, employment, destruction of homes, and a lack of basic necessities, all of which likely have detrimental effects on their physical and mental well-being [14, 15]. While refugees get better opportunities resettling in high-income countries in terms of employment, education, and livelihoods, the risks of post-resettlement mental health disorders are still prevalent in this group [16]. There is a well-established association between postmigration stressors, such as insecure immigration status, limited employment, and educational opportunities, and the development of mental health disorders [17, 18]. Multiple studies have consistently highlighted depression as a major mental health concern within the resettled Bhutanese population, primarily focusing on younger adults [19–22]. There are limited studies on depression among older Bhutanese refugees in the United States, leaving a critical gap in our understanding of the challenges faced by the older population. In contrast to their younger counterparts, older adults encounter obstacles related to transportation and language that may hinder their access to essential services, including healthcare [23].

The purpose of this study was to assess the prevalence of depressive symptoms among resettled Bhutanese older adults and explore the associations between depression and specific factors, including self-reported health, chronic morbidity, social support, life satisfaction, resiliency, and religious coping, among resettled Bhutanese older adults in Ohio.

Method

Study design, participants, and sampling

A community-based cross-sectional study was conducted from January to June 2022 to explore the basic health profile of resettled Bhutanese older adults in Ohio. Since there was no available sampling frame, random sampling was not feasible. Therefore, snowball sampling, a commonly used strategy for recruiting participants from hard-to-reach populations [24, 25], was employed with the assistance of local community leaders and Bhutanese organizations in the selected cities. The study included adults aged 55 years and above who resided in the four chosen cities. Notably, within refugee populations, individuals aged 55 and above are often categorized as older adults [26, 27]. This approach accounts for global differences in life expectancy, influencing how old age is defined and understood across various contexts [28].

Those who were unable to communicate (those with speech/language/hearing disorders), who resided in institutions, or who had cognitive impairment were excluded from the study. The following data were collected from a total of 276 respondents distributed across the cities: Columbus ($n = 120$, 43.5%), Cleveland ($n = 75$, 27.2%), Cincinnati ($n = 53$, 19.2%), and Akron ($n = 28$, 10.1%). These cities are home to a significant population of resettled Bhutanese individuals [9, 29]. For the depression assessment, two observations had missing values for at least one item in the construct. These observations were

excluded from the analytical sample, resulting in a final sample of 274 for analysis.

Study measures

The outcome variable in this study was depressive symptoms, and associated factors of interest included self-reported health, the presence of chronic diseases, social support, life satisfaction, resilience, and religious coping. Additionally, control variables included participants' sociodemographic factors, health behaviors, access to healthcare, and aspects related to refuge and resettlement, which are further detailed below.

Depressive symptoms

The Nepali version of the Geriatric Depression Scale (GDS) was used to assess depressive symptoms among the participants [30]. This scale consists of 15 items with binary responses designed to evaluate various depressive symptoms experienced in the previous week, including but not limited to feelings of sadness, loss of interest and energy, emptiness, helplessness, and guilt. In this study, a cumulative score was computed by summing the items, and a score of 5 or higher was indicative of depression [31]. Following recommendations, certain GDS items (items 1, 5, 7, 11, and 13) were reverse-coded before summation [31]. The GDS-15 is a highly valuable screening tool for assessing depressive symptoms in older adults [31, 32]. It has been pre-validated in Nepali, demonstrating a high sensitivity of 86.3%, specificity of 74.5%, and a Cronbach's alpha coefficient of 0.79 [30]. A review study that investigated the reliability of the GDS among Asian immigrants in the United States reported alpha values ranging from 0.72 to 0.87, indicating the scale's reliability among these populations [33]. Similarly, in the current study, the GDS-15 exhibited high-scale reliability, with a Cronbach's alpha coefficient of 0.85.

Self-reported health

Participants were asked a single-item question about their self-reported health, which was phrased as "Overall, how is your health in general?" Participants rated their health using a five-point Likert scale, with response options including "excellent," "very good," "good," "fair," and "poor." Previous studies have established the validity of this single-item health assessment for evaluating subjective health and well-being [34, 35]. Due to the limited number of participants who reported having excellent health, the categories of "very good" and "excellent" were combined.

Chronic morbidity

Participants were asked whether they had ever been informed or diagnosed by a health professional with any of the eight chronic conditions, which included hypertension, high cholesterol, heart disease, chronic obstructive pulmonary disorder, arthritis, kidney disease, diabetes, and cancer. Responses for each condition were recorded as "Yes" or "No." The total number of chronic conditions was calculated and categorized as either the absence or presence of at least one chronic condition.

Social Support

The pre-validated Nepali version of the Multidimensional Scale of Perceived Social Support (MSPSS), which has previously demonstrated construct validity and strong internal consistency (Cronbach's alpha of 0.90) among Nepali migrants in Hong Kong, was used to assess social support [36]. Our study also demonstrated a high level of reliability, with a Cronbach's alpha coefficient of 0.92. The MSPSS consisted of 12 items, each utilizing a 7-point Likert response format ranging from 1 ("very strongly disagree") to 7 ("very strongly agree"). These items assessed participants perceived social support from their social networks, which included family, friends, and significant others.

We calculated the mean MSPSS score by averaging participants' responses to all 12 items, resulting in a possible score range of 1 to 7. Subsequently, we categorized the mean scores into three groups: a mean score of 1 to 2.9 was classified as "low support," scores ranging from 3 to 5 as "moderate support," and scores above 5 as "high support" [37]. However, only one individual reported "low support." Consequently, we merged the "low support" and "moderate support" categories, and throughout the analysis, MSPSS was treated as a two-level categorical variable (high vs. lower support).

Life satisfaction

The 5-item Satisfaction With Life Scale (SWLS-5) [38] was used to assess life satisfaction. This tool assesses various aspects of individuals' satisfaction with their lives, including life ideality, personal goals, and conditions. The validity of the SWLS-5 tool was established in a prior study [39], and in the present study, the tool demonstrated good reliability (Cronbach's alpha of 0.89). Participants were asked to indicate their level of agreement with each of the five items using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total score was calculated by summing the scores of the individual items and ranged from 5 to 35. Since the total score exhibited a high degree of skewness, it was dichotomized as "dissatisfied" (a score of less than 20) or "satisfied" (a score of 20 or more) based on recommendations from the literature [40].

Resilience

The Nepali version of the Connor Davidson Resilience Scale (CD-RISC) [40] was used to assess resilience. This

10-item scale is designed to measure the psychological resilience of participants on a 5-point Likert scale ranging from 0 = "Not true at all" to 4 = "True nearly all the time". The scores from these 10 items were summed to create a cumulative score, which ranged from 0 to 40, with higher scores indicating greater resilience. To address the skewness in the total score distribution, the scores were divided into three categories based on tertiles, representing low, moderate, and high resilience. The Nepali version of the CD-RISC has previously been validated and has demonstrated high reliability, with a Cronbach's alpha of 0.89 [41]. Additionally, a previous study conducted in Sweden confirmed the CD-RISC as a robust psychometric tool for measuring resilience, noting its good discriminant and predictive validity [42]. Similarly, in this study, the scale exhibited high internal consistency, with a Cronbach's alpha of 0.96.

Religious coping

To assess religious coping, we employed the 17-item Hindu Religious Coping Scale (RCS-17) [42]. This scale measures participants' agreement with 17 different religious coping strategies using a 4-point Likert scale (1 = "Never done"; 2 = "I have done it sometimes"; 3 = "I have done it almost as much"; 4 = "Always doing"). The cumulative score was calculated based on the 17 items, with higher scores indicating a greater degree of religious coping. However, it is worth noting that the responses were found to be nonnormally distributed ($p < 0.001$) and exhibited a strong skew toward higher levels of religious coping. Consequently, the sum was categorized into three groups based on tertiles, representing low, moderate, and high levels of coping. The tool has been previously validated and demonstrated discriminant, convergent, and construct validity, as well as good internal consistency, with an alpha coefficient exceeding 0.80 [43]. A previous study conducted among Bhutanese individuals in the United States reported a Cronbach's alpha of 0.90, indicating a high level of internal consistency [44]. Similarly, our study revealed a high level of reliability for the scale, with Cronbach's alpha of 0.88.

Control variables

Various factors related to sociodemographic characteristics, health behaviors, access to health care, and refugee and resettlement experiences were included as control variables. Sociodemographic variables consisted of the city of residence (Akron, Cincinnati, Cleveland, and Columbus), age (grouped into 55–64, 65–74, and 75 + years [26]), gender (male/female), marital status (married/without a partner), religion (Hindu/other than Hindu), formal education (yes/no), and current employment status (yes/no). Health behavior variables included smoking, tobacco use, and alcohol use, each recorded in a "yes/no" format, along with self-reported physical activity levels categorized as high, medium, or low. Variables related to access to health care included whether participants had a regular doctor, the type of health insurance they had, the need for and availability of an interpreter during healthcare encounters, and the time elapsed since their last visit to a health facility. Health facility visit frequency was classified into two groups: within the last year or more than one year ago. The number of years spent in refugee camps and in the United States was also considered.

Data collection

The Institutional Review Board (IRB) at Miami University (MU, Protocol ID: 03942e) approved the study. Verbal informed consent was obtained from the participants before the interview, during which they were informed of the study procedures and their rights, including voluntary participation and withdrawal at any point. The procedure of informed consent was approved by the IRB-MU. The original English-language questionnaire was translated into Nepali to facilitate the data collection process. The questionnaire was pretested among resettled Bhutanese older adults residing in Cincinnati. There were no major edits in the contents, and some minor typographical errors and wordings were corrected. The data were collected using a variety of methods, which included conducting in-person and telephone interviews as well as administering an online survey through Qualtrics, a secure online survey and research platform [45]. Experienced research assistants, who were proficient in Nepali completed relevant coursework and possessed prior experience in health and social research, conducted these interviews. The research assistants used the Nepali version of the questionnaire for data collection. To ensure their familiarity with our survey, these research assistants underwent a comprehensive two-day orientation program by the research team. This orientation encompassed essential elements, including study objectives, survey methodology, the use of study tools, and proficiency in utilizing Qualtrics for data entry. Following data collection, all the data gathered through in-person and telephone interviews were entered into Qualtrics. Subsequently, the data were imported into SAS software for further data management and analysis.

Data analyses

The data were analyzed utilizing SAS version 9.4 software [46]. All the variables were summarized using frequencies and percentages, considering the categorical nature of our variables. To evaluate disparities in participant characteristics between those exhibiting depressive symptoms and those without, we employed chi-square tests. Binary logistic regression was employed to examine the

association between each associated factor and depressive symptoms while controlling for the covariates. Both unadjusted and adjusted odds ratios, along with their corresponding 95% confidence intervals, are reported. In the adjusted model, variable selection was based on the Akaike information criterion. The initial model included all variables listed in Additional File 1, but the final model retained only age, sex, marital status, education, and physical activity. A p-value less than 0.05 indicated statistical significance.

Results

Characteristics of study participants

Table 1 provides an overview of the study participants. Of the 274 participants, the largest age group was between 65 and 74 years (40.5%), and slightly more than half were female (51.1%). The majority were married (74.5%), identified as Hindu (78.5%), and lacked formal education (85.0%). Regarding health behaviors, most participants did not smoke (65.3%) or use tobacco (62.8%), and the vast majority refrained from alcohol consumption (86.1%). None of the older adults lived alone; they resided with their spouse, children, grandchildren, or other family relatives. Approximately four out of ten participants reported low levels of physical activity. English proficiency (reading, writing, or speaking) was limited among many participants (specific data not shown). Access to healthcare was robust, with nearly all participants having a regular doctor for check-ups (96.7%), possessing health insurance (98.9%), and having access to interpreters (98.8%). A significant portion (94%) had visited a healthcare facility within the past year. All participants had a history of living in a refugee camp, with nearly half (46.4%) spending 20 years or more in such camps.

The prevalence of depression was 31.8%. Concerning the health status of the participants, over half reported either poor (23.4%) or fair (37.2%) health, and the majority had at least one chronic disease (62.8%). A significant proportion reported having high levels of social support (89.4%) and expressed satisfaction with their life (90.1%). Several of these variables exhibited significant associations with depressive symptoms, including age ($p < 0.05$), gender ($p < 0.05$), marital status ($p < 0.01$), formal education ($p < 0.01$), physical activity level ($p < 0.001$), self-reported health ($p < 0.001$), the presence of chronic diseases ($p < 0.001$), social support ($p < 0.001$), life satisfaction ($p < 0.001$), and resilience ($p < 0.001$).

Table 2 presents the unadjusted and adjusted odds ratios, along with their corresponding 95% confidence intervals, obtained from binary logistic regression analysis. The initial model included all the variables listed in Additional File 1, and variable selection for adjustment was based on the AIC. Therefore, the adjusted odds ratios presented in Table 2 were adjusted for age, sex, marital status, education, and physical activity. After adjustment, except for religious coping, all other associated factors, i.e., self-reported health ($p < 0.05$), chronic morbidity ($p < 0.01$), social support ($p < 0.001$), life satisfaction ($p < 0.001$), and resilience ($p < 0.001$), showed significant associations with depressive symptoms.

Individuals who reported better health had lower odds of experiencing depressive symptoms. Compared to those with poor self-reported health, individuals reporting fair health had 53% lower odds (OR: 0.47, 95% CI: 0.22–1.00), those with good health had 74% lower odds (OR: 0.26, 95% CI: 0.10–0.66), and those with very good health had 92% lower odds (OR: 0.08, 95% CI: 0.01–0.74) of experiencing depressive symptoms. Similarly, participants with one or more chronic diseases had 2.6 times greater odds of experiencing depressive symptoms than those without chronic conditions (OR: 2.61, 95% CI: 1.28–5.31). Participants with high levels of social support were 86% less likely to experience depressive symptoms than those with lower social support (OR: 0.14, 95% CI: 0.05–0.41). Individuals who reported satisfaction with life had 94% lower odds of experiencing depression than did those who reported dissatisfaction (OR: 0.06, 95% CI: 0.02–0.23). Resilience exhibited an inverse association with depressive symptoms, i.e., individuals with high resilience had lower odds of depressive symptoms (OR: 0.27, 95% CI: 1.78–8.16), whereas those with low resilience had higher odds (OR: 3.80, 95% CI: 1.78–8.16).

Discussion

This study represents the first attempt to evaluate the prevalence of depressive symptoms and their underlying factors among resettled Bhutanese older adults residing in Ohio, United States. The study's results revealed a notably high prevalence of depressive symptoms in this population and revealed several key contributing factors. These factors include self-reported health, chronic health conditions, social support, life satisfaction, and resilience, underscoring the complex and multifaceted nature of the issue.

The findings regarding the high prevalence of depressive symptoms among older Bhutanese individuals align with the findings of previous studies on depression among refugee populations [17, 47, 48]. For example, a study focused on Hmong refugees aged 55 and above, one of the least privileged Asian American groups originating from highland Laos, reported that more than 72% of older Hmong individuals exhibited depressive symptoms [49]. Another study involving Bhutanese refugees in the United States aged 18 and above revealed that older individuals were more likely to experience depressive symptoms [21]. Several potential factors may explain these observed findings. First, it is plausible that the older Bhutanese adults in our study may still have experienced

Table 1 *Characteristics of the study participants by depressive symptoms*

Characteristics	Total (*n* = 274; 100%)	Depressive symptoms		
		Present (*n* = 87; 31.8%)	Absent (*n* = 187; 68.3%)	
	n (%)	n (%)	n (%)	p value
Sociodemographics				
City of Residence				0.134
Akron	28 (10.2)	12 (13.8)	16 (8.6)	
Cincinnati	53 (19.3)	15 (17.2)	38 (20.3)	
Cleveland	74 (27.0)	17 (19.5)	57 (30.5)	
Columbus	119 (43.4)	43 (49.4)	76 (40.6)	
Age in Years				0.016
55–64	80 (29.2)	17 (19.5)	63 (33.7)	
65–74	111 (40.5)	35 (40.2)	76 (40.6)	
75+	83 (30.3)	35 (40.2)	48 (25.7)	
Gender				0.013
Male	134 (48.9)	33 (37.9)	101 (54.0)	
Female	140 (51.1)	54 (62.1)	86 (46.0)	
Marital Status				0.004
Married	204 (74.5)	55 (63.2)	149 (79.7)	
[1]Without a partner	70 (25.5)	32 (36.8)	38 (20.3)	
Religion				0.239
Hindu	215 (78.5)	72 (82.8)	143 (76.5)	
[2]Other than Hindu	59 (21.5)	15 (17.2)	44 (23.5)	
Formal Education				0.004
No	233 (85.0)	82 (94.3)	151 (80.7)	
Yes	41 (15.0)	5 (5.7)	36 (19.3)	
Currently Employed				
No	252 (92.0)	87 (100.0)	165 (88.2)	-
Yes	22 (8.0)	0	22 (11.8)	
Health Behaviors				
Smoking				0.617
No	179 (65.3)	55 (63.2)	124 (66.3)	
Yes	95 (34.7)	32 (36.8)	63 (33.7)	
Tobacco Use				0.710
No	172 (62.8)	56 (64.4)	116 (62.0)	
Yes	102 (37.2)	31 (35.6)	71 (38.0)	
Alcohol Use				0.726
No	236 (86.1)	74 (85.1)	162 (86.6)	
Yes	38 (13.9)	13 (14.9)	25 (13.4)	
Self-reported Physical Activity Level				< 0.001
High	37 (13.5)	4 (4.6)	33 (17.6)	
Medium	127 (46.4)	23 (26.4)	104 (55.6)	
Low	110 (40.1)	60 (69.0)	50 (26.7)	
Access to Healthcare				
Has a Regular Doctor				0.176
No	9 (3.3)	1 (1.1)	8 (4.3)	
Yes	265 (96.7)	86 (98.9)	179 (95.7)	
Type of Health Insurance				< 0.001[a]
No insurance	3 (1.1)	0 (0.0)	3 (1.6)	
Dual (Medicare and Medicaid)	20 (7.3)	14 (16.1)	6 (3.2)	
Medicare	28 (10.2)	5 (5.7)	23 (12.3)	
Medicaid	201 (73.4)	62 (71.3)	139 (74.3)	
Employment-based	11 (4.0)	1 (1.1)	10 (5.4)	
Unknown/others	11 (4.0)	5 (5.8)	6 (3.2)	

Table 1 (continued)

Characteristics	Total (*n* = 274; 100%)	Depressive symptoms		
		Present (*n* = 87; 31.8%)	Absent (*n* = 187; 68.3%)	
	n (%)	n (%)	n (%)	p value
Interpreter Needed				0.628
Yes	252 (92.0)	79 (90.8)	173 (92.5)	
No	22 (8.0)	8 (9.2)	14 (7.5)	
Interpreter Available				0.936
Yes	247 (98.8)	77 (98.7)	170 (98.8)	
No	3 (1.2)	1 (1.3)	2 (1.2)	
Time Elapsed since Last Health Facility Visit				0.088
Within the last year	258 (94.2)	85 (97.7)	173 (92.5)	
[3]Never/more than a year	16 (5.8)	2 (2.3)	14 (7.5)	
Refuge and Resettlement				
Lived in Camp				
Yes	269 (100.0)	87 (100.0)	182 (100.0)	
Years Spent in Refugee Camp				0.920
Less than 20	142 (53.6)	47 (54.0)	95 (53.4)	
20 or more	123 (46.4)	40 (46.0)	83 (46.6)	
Years in the United States				0.137
10 or less	108 (40.9)	30 (34.5)	78 (44.1)	
More than 10	156 (59.1)	57 (65.5)	99 (55.9)	
Associated factors				
Self-reported Health				< 0.001
Poor	64 (23.4)	41 (47.1)	23 (12.3)	
Fair	102 (37.2)	33 (37.9)	69 (36.9)	
Good	84 (30.7)	12 (13.8)	72 (38.5)	
Very Good/Excellent	24 (8.8)	1 (1.1)	23 (12.3)	
Chronic Morbidity				< 0.001
None	102 (37.2)	15 (17.2)	87 (46.5)	
Single/multiple diseases	172 (62.8)	72 (82.8)	100 (53.5)	
Social Support				< 0.001
Lower Support	29 (10.6)	22 (25.6)	7 (3.7)	
High Support	244 (89.4)	64 (74.4)	180 (96.3)	
Life Satisfaction				< 0.001
Dissatisfied	27 (9.9)	24 (27.9)	3 (1.6)	
Satisfied	246 (90.1)	62 (72.1)	184 (98.4)	
Resilience				< 0.001
Low	90 (33.0)	55 (64.0)	35 (18.7)	
Moderate	85 (31.1)	22 (25.6)	63 (33.7)	
High	98 (35.9)	9 (10.5)	89 (47.6)	
Religious Coping				0.063
Low	95 (34.8)	34 (39.5)	61 (32.6)	
Moderate	87 (31.9)	19 (22.1)	68 (36.4)	
High	91 (33.3)	33 (38.4)	58 (31.0)	

Note.[a]p-value fro Fisher's Exact test; rest of the p values are from the chi-square test comparing participants' characteristics between those with and without depressive symptoms

[1] Separated/divorced, widowed/widowered, and unmarried were combined into "without a partner."

[2] Buddhist, Kirati, Christian, and others were combined into "other than Hindu."

[3] "Within the last 1 to 2 years", "last 2 to 5 years", and "Never done health check-ups" were combined into "Never/more than a year"

the enduring stress and trauma of their forceful displacement from Bhutan in the 1990s [6]. During the extended refugee stage in Nepal's refugee camps, refugees lived in dire conditions with limited resources and faced significant daily life stressors. Additional stressors were introduced during resettlement and integration into U.S. culture and society. Throughout this challenging journey, they likely encounter numerous stressors attributed

Table 2 Unadjusted and adjusted odds ratios (ORs) for the Presence of depressive symptoms from binary logistic regression

Associated factors	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Self-reported Health		
Poor	Reference	Reference
Fair	0.30 (0.15–0.60)***	0.47 (0.22–1.00)
Good	0.12 (0.05–0.27)***	0.26 (0.10–0.66)**
Very good	0.04 (0.00–0.32)***	0.08 (0.01–0.74)*
Chronic Morbidity		
None	Reference	Reference
Single/multiple diseases	3.34 (1.73–6.44)***	2.61 (1.28–5.31)**
Social Support		
Lower Support	Reference	Reference
High Support	0.13 (0.05–0.33)***	0.14 (0.05–0.41)***
Life Satisfaction		
Dissatisfied	Reference	Reference
Satisfied	0.06 (0.02–0.20)***	0.06 (0.02–0.23)***
Resilience		
Low	4.65 (2.34–9.24)***	3.81 (1.78–8.16)***
Moderate	Reference	Reference
High	0.28 (0.12–0.69)***	0.27 (0.10–0.71)***
Religious Coping		
Low	2.02 (0.99–4.09)	1.80 (0.82–3.94)
Moderate	Reference	Reference
High	1.73 (0.86–3.49)	1.33 (0.61–2.86)

Note. *p-value significant at < 0.05, ** p-value significant at < 0.01, *** p-value significant at < 0.001

to language barriers, religious and cultural differences, acculturation stress, discrimination, transportation limitations, unemployment, etc [23]. In accordance with the life course approach to aging [50], the cumulative stressors experienced throughout their lives may have played a substantial role in contributing to the higher prevalence of depression among older Bhutanese adults.

Among the correlates, better self-reported health, the absence of chronic disease, high social support, satisfaction with life, and high resilience were associated with lower odds of depressive symptoms. Both subjective health and chronic morbidity exhibited significant associations with depression in both bivariate and regression analyses, with poor health ratings and the presence of chronic morbidities being linked to higher depression scores. In line with our findings, a previous study centered on depression among Bhutanese refugees in the United States also documented a connection between better health and depression [22]. The relationship between physical health or morbidity and mental health has garnered support from numerous studies, all indicating a heightened risk of depression among individuals with both single and multiple chronic conditions [51, 52]. An extensive study on depression and multimorbidity in late life has shed light on the bidirectional connection between these two conditions, likely linked to accelerated aging processes [51, 53]. An additional underlying mechanism that can elucidate how chronic diseases contribute to or worsen depression lies in the burden of coping with chronic morbidity itself. Following a diagnosis, individuals often contend with feelings of uncertainty, anxiety, and a profound sense of health-related loss, significantly affecting their quality of life and heightening their vulnerability to depressive symptoms [54, 55]. Furthermore, chronic conditions, compounded by factors such as physical deterioration, reduced physical activity levels, social stigma, and increasing social isolation [54, 55], can impede one's sense of self, self-esteem, and control over one's life, shaping one's identity and subjecting one to social stigma, isolation, and poorer mental health [54]. Recognizing and understanding these factors is crucial for providing comprehensive care and managing the potential exacerbation of depression. A holistic healthcare approach that considers both physical and mental health and addresses the psychosocial burden of chronic conditions could significantly benefit the well-being of older adults.

Consistent with previous research, social support was identified as a protective factor against depression in older refugees [21, 56, 57]. It is well-established that social support is crucial for maintaining both physical and psychological well-being [58]. Coping strategies used by individuals when they are stressed can also be extended to help those in distress as a form of assistance [59]. Studies have demonstrated that robust social support can enhance resilience against poor mental health outcomes associated with stress and trauma [58]. More specifically, social support achieves this by reducing risky behaviors and providing external coping mechanisms during stressful situations [58]. Hence, group belongingness, social identity, and social support have been recognized as protective factors benefiting the mental health of refugees [60]. Specifically, among our participants, the majority of whom lacked formal education and English language proficiency, heavily relied on and received strong support from their families during their transition to a new society [23]. This underscores that older Bhutanese individuals may indeed have access to the resources provided by robust social support against depression.

Higher life satisfaction predicts lower depression risk, consistent with prior studies [61–63]. This relationship holds true even among internally displaced individuals, where increased life satisfaction is linked to reduced mental health issues, including anxiety and depression [63]. In studies examining life satisfaction and depression, Asian cultures, including the Nepali-Bhutanese culture, have focused on family structure and relationships, recognizing them as protective elements [62, 64]. This emphasis on shared family values, which are consistent

across Asian cultures, underscores the importance of filial duty and family support for older parents [64, 65]. Residing in an extended family setting and benefiting from moral support and informal caregiving provided by their children could have contributed to a sense of contentment among our participants. These cultural norms are linked to higher life satisfaction and a decrease in depressive symptoms among older adults [64]. Mental health interventions may benefit from including a component of personal fulfillment to empower individuals to take proactive steps to improve their life satisfaction.

Resilience is frequently linked to mental health, explaining its protective function against conditions such as depression, stress, or trauma [21, 66–68]. This study further supports this connection. Previous research indicates that resilience strengthens an individual's ability to navigate difficult life circumstances, emphasizing its role as a personal coping mechanism [66, 67]. Moreover, within the framework of the social ecology of resilience theory, it is crucial to recognize that resilience does not depend solely on individual efforts to access resources [69]. Instead, it represents a shared characteristic between individuals and their social environment, with the social context playing a pivotal role in promoting enduring well-being and recovery among populations facing adversity [69, 70]. Resilient individuals typically employ positive coping strategies, such as maintaining a positive mindset, seeking support from others, and engaging in problem-solving [66]. These factors empower them to effectively manage challenges that might otherwise contribute to adverse mental health outcomes. Resilience training that includes but is not limited to education, awareness, and resilience-building activities such as mindfulness exercises or support groups can contribute to improved mental health.

Strengths and limitations of the study

This study has several notable strengths. It included four major cities with substantial resettled Bhutanese populations in Ohio (Columbus, Cleveland, Cincinnati, and Akron). This study's emphasis on the population aged 55 years and above allowed for a targeted exploration of a demographic often underrepresented in research. Bhutanese refugees resettled in the United States are grouped within broader Asian American categories, which can obscure their distinct health challenges [71], and moreover, they are recognized as hard-to-reach population [72]. The study findings obtained offer valuable insights into the unique challenges, needs, and potentials within this age segment among the resettled Bhutanese people, shedding light on critical factors that influence their mental health. Conducting interviews in the Nepali language likely facilitated effective communication and ensured accurate interpretation of responses. Additionally, the interviewers shared similar sociocultural and linguistic backgrounds with the participants and possessed graduate-level training in survey design and research methodology, enhancing the reliability of the data collection. Moreover, the survey utilized validated Nepali assessment tools for depression, social support, life satisfaction, and resilience scales, thereby bolstering the validity of the measures employed in the study.

Nonetheless, it is important to acknowledge certain limitations of this study. The cross-sectional nature of the study restricts the ability to draw causal inferences. Furthermore, while random sampling was the preferred and ideal method, the absence of a suitable sampling frame necessitated the use of snowball sampling, potentially introducing selection bias [25]. Thus, the study participants may not fully represent the broader population of resettled Bhutanese older adults, and the study findings infer only to the study sample. Nevertheless, snowball sampling is a frequently employed method for recruiting hard-to-reach populations, such as the resettled Bhutanese community in the United States [24]. Additionally, the reliance on self-reported data may have introduced recall and social desirability biases into the study.

Conclusions

This study revealed a notably high prevalence of depressive symptoms among resettled Bhutanese older adults residing in Ohio, highlighting several contributing factors, including self-reported health, chronic health conditions, social support, life satisfaction, and resilience. Given the scarcity of studies on the older Bhutanese population in the United States, this research can serve as foundational evidence to support further investigations and guide institutional actions at the local and state levels. The elevated prevalence of depressive symptoms among resettled Bhutanese individuals in the United States underscores the immediate necessity for tailored mental health interventions and support services addressing the unique challenges faced by this community. Furthermore, the observed link between morbidity and depression underscores the critical importance of adopting a comprehensive and holistic approach to health assessment and care. Additionally, the study underscores the significance of social support and resilience as protective factors against depression among older Bhutanese refugees, emphasizing the need to advocate for programs and interventions designed to fortify social support networks, foster a greater sense of belonging, enhance resilience, elevate life satisfaction, and ultimately enhance the mental well-being of the older Bhutanese population.

Several opportunities for future research exist in this domain. Future studies should consider employing a longitudinal design to investigate the trajectories of depressive symptoms and mental health outcomes at various

stages of resettlement among Bhutanese and other refugee populations. Qualitative research can complement quantitative findings by providing a deeper understanding of the cultural and contextual factors that influence the mental health of resettled Bhutanese older adults in the United States. An intriguing avenue for exploration would involve comparing the mental health of Bhutanese refugees in the United States with that of Bhutanese individuals who remained in Bhutan or Nepal. This comparative analysis could help ascertain whether factors such as migration and resettlement have a discernible impact on mental health outcomes.

Abbreviations

CD-RISC	Connor davidson resilience scale
CI	Confidence interval
GDS	Geriatric depression scale
IRB	Institutional review board
MSPSS	Multidimensional scale of perceived social support
MU	Miami university
OR	Odds ratio
RCS	Religious coping scale
SAS	Statistical analysis system
SWLS	Satisfaction with life scale

Supplementary Information

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Supplementary Material 1

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Author contributions

IK, BC, and SG contributed to the conceptualization of this study. AS, IK, and SG collected the data. IK and SG analyzed the data. IK and BC interpreted the findings. IK and BC wrote the original draft. JS, SG, UNY, and SKM contributed to the initial review. IK and AS revised and finalized the manuscript. The final version of the manuscript was read and approved by all authors.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The research was conducted in accordance with the ethical principles outlined in the Belmont Report. The IRB-at Miami University (Protocol ID: 03942e) approved the study. Verbal informed consent was obtained from the participants before the interview, during which they were informed of the study procedures and their rights, including voluntary participation and withdrawal at any point. The procedure of informed consent was approved by the IRB-at Miami University.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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