Loneliness in the Assyrian diaspora: the role of generational factors

Shameran Slewa-Younan[1,2,3*], Thomas P. Nguyen[1,4,5], Iman Hegazi[6] and Andre M.N. Renzaho[2]

Abstract

Background Loneliness, a key factor in wellbeing, is under-researched within migrant communities. This study examines loneliness among the Assyrian-Australian diaspora, an ethnoreligious group with a prolonged history of persecution and role of generational differences.

Methods An online survey of 210 Assyrian-Australian adults measured socio-demographic variables and loneliness using the UCLA Loneliness Scale.

Results Findings demonstrated that approximately 65.7% of participants reported moderately high to high degrees of loneliness which was influenced by generation (higher rates of loneliness among second generation) and socio-demographic variables such as age (increased loneliness was noted in the younger participants from second generation and older participants from first generation) and poorer self-reported general health. Participants suggested addressing loneliness through nationalistic activities, mental health education, peer support, and social infrastructure.

Conclusion These findings highlight the importance of understanding the relationship between loneliness in specific Assyrian-Australian subgroups and provides directions to inform the delivery of targeted psychosocial interventions and future research within this community.

Keywords Assyrians, Migrants, Loneliness, Mental wellbeing, Community, Generational differences

*Correspondence:
Shameran Slewa-Younan
s.younan@westernsydney.edu.au
[1]Mental Health, School of Medicine, Western Sydney University, Locked Bag 1797, Penrith South DC , Sydney, NSW, Australia
[2]Translational Health Research Institute, School of Medicine, Western Sydney University, Sydney, Australia
[3]Centre for Mental Health and Community Wellbeing, Melbourne School of Population and Global Health, University of Melbourne, Melbourne, Australia
[4]Department of Psychiatry, Austin Hospital, University of Melbourne, Heidelberg, VIC, Australia
[5]Clinical Sciences, Murdoch Children's Research Institute, Melbourne, Australia
[6]Medical Education Unit, School of Medicine, Western Sydney University, Sydney, Australia

Introduction

Assyrians are an indigenous ethnic group and are contemporary descendants of the ancient Assyrians, who ruled an empire in northern Mesopotamia which spans across modern-day northern Iraq and Iran, Syria and south-eastern Turkey [1, 2]. There are approximately 3.3 million Assyrians worldwide which includes those who remain in their ancestral homelands and the Assyrian diaspora [2]. Assyrians were one of the first groups to embrace Christianity which along with their collectivist values, cultural traditions and language, forms a strong part of contemporary Assyrian identity [1, 3].

Over the past century, the Assyrian population has been repeatedly subjected to politically and religiously driven persecution which has caused significant upheaval

and forced displacement [3]. These atrocities notably include massacres by the Ottoman Empire during World War 1, political reprisals during Saddam Hussein's rule from 1979 to 2003 and more recently, the 2014 attacks of the Assyrian homelands by terrorist group, Islamic State [2]. As such, the number of Assyrians who remain in their homelands has dwindled over the last few decades, with the population of the Assyrian diaspora increasing as a result. The Assyrian diaspora is now spread across many different countries across the world, predominantly in high-income Western nations such as the United States, Sweden, Germany and Australia [4].

According to the 2021 Australian Census, there are approximately 42,346 Australians who identify as Assyrian with 41,201 Assyrians reporting that at least one of their parents was born overseas [5, 6]. Of those identifying as Assyrian, 28,977 individuals had immigrated to Australia. Over half (14,545) of all Assyrian-Australian immigrants arrived between 2011 and 2020, coinciding with the Australian government's one-off approval for an additional 12,000 humanitarian visas for Syrian and Iraqi refugees in 2015 during the war against Islamic State [6].

Immigrants and refugees commonly experience significant post-migration stressors (e.g. financial stress, housing instability, discrimination, family separation and loneliness) which have been shown to negatively affect the mental health of these vulnerable populations [7]. In particular, previous research has shown that loneliness disproportionately affects refugees and non-Western immigrants [8, 9] which is concerning given the mental and physical health sequelae that is associated with being lonely [9, 10]. Reporting poor self-rated general health, being either of older age, female, widowed or newly arrived all appear to be risk factors for loneliness in both immigrants and refugees [9, 11–13].

There are thought to be many hypotheses as to why these populations may disproportionately experience loneliness. Firstly, refugees and immigrants may lack social supports due to family separation and limited local co-ethnic ties [9, 14]. This may be compounded by language barriers and a lack of understanding of local organisational processes which may hinder the ability to access services and join social groups [9, 14]. Immigrants and refugees may also develop loneliness as a result of experiences of discrimination and less perceived hospitality which may be perpetuated by negative media discourses about these populations, acculturative difficulties and exclusionary government policies such as cutting migration numbers and reducing access to healthcare and social support services to immigrants as well as those with insecure visa statuses [9, 14].

Despite the knowledge that loneliness disproportionately affects immigrants and refugees, no research to date has sought to understand how loneliness may affect diasporic Assyrians, in particular those living in Australia. Understanding the prevalence and risk factors of loneliness in this population may help clinicians and community groups develop culturally appropriate interventions to address loneliness as well as its mental health sequelae. This study thus aims to cross-sectionally survey levels of loneliness in Australians of Assyrian background and understand what socio-demographic factors may be associated with higher levels of loneliness. Drawing on the reviewed literature on migrant mental health and loneliness, this study had three hypotheses. Firstly, it was hypothesised that Assyrian-Australians would report higher levels of loneliness compared with population norms. Secondly, factors such poorer self-rated general health, being single, widowed or divorced and those unemployed would be associated with higher levels of loneliness. Finally, loneliness would be higher amongst those Assyrians born overseas (first-generation) compared to those born in Australia (second-generation) and most notably associated with shorter lengths of stay in Australia.

Method

Ethics

This study received approval from the Human Research Ethics Association of Western Sydney University (H15304).

Participant recruitment

Recruitment flyers detailing the purpose of the study and inclusion criteria were distributed through organisations such as churches, social clubs, medical practices, culturally specific groups and other non-government offices which serviced the Assyrian community. Those interested were recruited through Quick Response (QR) code included in flyers. Participation was voluntary. The inclusion criteria were: (1) being 18 years or older, (2) currently living in Australia, and (3) identifying as an Assyrian. Upon entering the Qualtrics survey, participants were presented with a Participant Information Statement (PIS) and were required to select 'yes' if they met the eligibility criteria. Subsequently, participants actively consented to participate or not. Only participants who met the eligibility criteria and consented to participate were admitted to the rest of the survey. The average completion duration of the survey was 30.6 minutes.

Survey

The survey consisted of 60 questions and was available for completion in both Arabic and English. This paper reports on data related to socio-demographic information and loneliness (UCLA Loneliness Scale). At the conclusion of the UCLA Loneliness Scale, an open-ended question was presented asking participants to list some

Table 1 Descriptives for Assyrians born in Australia and those born overseas

Variables	Total Sample †		Born in Australia		Born Overseas	
	N	Mean ±SD, Proportions	N	Mean ±SD, Proportions	N	Mean ±SD, Proportions
Age (in years) ***,#	276	31.7, ±12.5	133	25.8, ±6.9	143	37.1, ±14.3
Gender *,^						
Man	105	36.6%	40	29.6%	65	42.8%
Woman	18	63.4%	95	70.4%	87	57.2%
Marital Status **,^						
Single	102	39.2%	72	55.8%	30	22.9%
Married/Co-habiting	149	57.3%	55	42.6%	94	71.8%
Divorced/Separated/Widow	9	3.5%	2	1.5%	7	5.4%
Number of children ***,#		0.98, ±1.4		0.29, ±0.69		1.64, ±1.57
Religious Affiliation						
Agnostic	7	2.7%	6	4.7%	1	0.8%
Atheist	10	3.9%	4	3.1%	6	4.6%
Assyrian (Ashurist)	6	2.3%	-	-	6	4.6%
Ancient Church of the East (Orthodox)	19	7.3%	12	9.4%	7	5.3%
Assyrian Church of the East	19	7.3%	17	13.3%	2	1.5%
Christian	178	68.7%	79	61.7%	99	75.6%
Catholic (incl. Chaldean and Syriac Catholic Church)	20	7.7%	10	7.8%	10	7.7%
Education						
Secondary or less	79	30.4%	32	24.8%	47	35.9%
Tertiary	181	69.6%	97	75.2%	84	64.1%
Employment Status ***,^						
Unemployed	28	10.8%	7	5.4%	21	16.0%
Students	60	23.1%	48	37.2%	12	9.2%
Employed	151	58.1%	73	56.6%	78	59.5%
Other	21	81.9%	1	0.8%	20	15.3%
Length in Australia (in years)	-		-			24.7, ±27.9
General Health						
Very Poor	6,	2.3%	3	2.3%	3	2.3%
Poor	15	5.8%	10	7.8%	5	3.8%
Fair	51	19.6%	25	19.4%	26	19.9%
Good	98	37.7%	49	37.9%	49	37.4%
Very Good	60	23.1%	31	24.0%	29	22.1%
Excellent	30	11.5%	11	8.5%	19	14.5%
UCLA Loneliness Scale *,#		44.3, ±16.2		46.7, ±16.6		42.1, ±15.5
UCLA Loneliness Categories						
Low degree of loneliness	66	31.4%	27	26.0%	39	36.8%
Moderate degree of loneliness	68	32.4%	32	30.8%	36	40.0%

Slewa-Younan *et al. BMC Public Health*   (2025) 25:3297

Page 4 of 11

Table 1 (continued)

Variables	Total Sample †		Born in Australia		Born Overseas	
	N	Mean ±SD, Proportions	N	Mean ±SD, Proportions	N	Mean ±SD, Proportions
Moderately high degree of loneliness	50	23.8%	30	28.9%	20	18.9%
High degree of loneliness	26	12.4%	15	14.4%	11	10.4%

†Total sample *n* varies across different variables

#based on independent t-test

^based on Chi-square

*p <.05

**p <.001

***p <.001

of the ways that could help Assyrian people cope with loneliness. Participants were encouraged to name as many activities or events as they wished.

Measures

The UCLA loneliness scale

The UCLA Loneliness Scale is a 20-item self-report tool used to assess one's subjective feelings of loneliness and dissatisfaction through one's quantity and quality of interpersonal relationships [15]. Participants selected the option that best describes their agreement with the statement (e.g., *"I lack companionship"*, *"I feel completely alone")* on a 4-point Likert scale ranging from 1 "Never" to 4 "Often". Scores range from 20 to 80, with higher scores indicating greater levels of loneliness. Scores of 20 to 34 indicate a low degree of loneliness, 35 to 49 a moderate degree, 50 to 64 a moderately high degree, and 65 to 80 a high degree of loneliness [16]. The scale has excellent psychometric properties and is validated in English and Arabic [17, 18]. The Cronbach's alpha in this study was 0.9639.

Covariates

A range of sociodemographic factors were examined as covariates on loneliness in the first- and second-generation Assyrians. These included age, gender (man, woman or prefer not to say), religion (collapsed into Christian and Atheist/Agnostic/Other), years residing in Australia (first-generation Australian Assyrians only), marital status, number of children, education and employment. Additionally, we measured self-rated general health using a 6-point Likert scale ranging from 1 "very poor" to 6 "excellent".

Data analysis

Data were analysed using Stata version 18.0 [19]. Continuous variables were summarised using descriptive statistics, including the number of observations (n), mean, and standard deviation (SD), for variables such as age, number of children, length of residence in Australia, and loneliness scale scores. These statistics were presented separately for Assyrians born in Australia and those born overseas, with the independent t-test used to compare means between these two groups. Categorical variables were summarised using frequencies and percentages for each category, also stratified by country of birth (Australia vs. overseas), with Chi-Square used to test the difference between the two groups. Bivariate and multivariable linear regression analyses were performed using Gaussian generalised linear models (GLMs) with gaussian family, identity link functions and robust standard errors to examine the relationship between loneliness and participants socio-demographic and economic factors. GLMs were preferred in this study due to their

ability to accommodate non-normal and skewed continuous data, as the response variable can follow any distribution within the exponential family. They are also well-suited for handling heteroscedasticity, where the variability of the outcome is not constant across levels of an independent variable. Additionally, GLMs can manage predicted values that extend beyond the observed range and model non-linear relationships through the use of appropriate link functions [20, 21]. This flexibility allows researchers to select a link function that connects the linear predictor to the expected value of the response in a way that aligns with the data distribution. In our analysis, we specified the Gaussian family, effectively reducing the GLM to a normal distribution framework. We employed the identity link function, which corresponds to standard linear regression, and applied the robust option to account for outliers and potential deviations from distributional assumptions [21]. We initially undertook a series of bivariate analysis to examine the relationship between loneliness and migrants' socio-demographic and economic factors. Multivariable regression analyses included all socio-demographic and economic factors as explanatory variables for loneliness. We report both unstandardised and standardised beta-coefficients in the bivariable and multivariable linear regressions. Since the 'GLM' Stata command does not have options for estimating standardised beta coefficients, we standardised each variable by subtracting the mean from the data point and divide the result by the standard deviation using the Stata 'egen' command [(i.e. egen std_var = std(var)]. In the standardised models, the beta-coefficients represent the expected change in the dependent variable (in standard deviations) for a one standard deviation change in an explanatory variable (and, while holding other explanatory variables constant in the multivariable models). In our analysis, we assessed homogeneity of variance and tested for multicollinearity using linear regression diagnostics. Multicollinearity was evaluated using Variance Inflation Factors (VIF), as collinearity is a property of the independent variables and is not dependent on the type of regression model used. A VIF value of less than 4 was considered acceptable, indicating no serious multicollinearity [22]. Those variables with p-value < 0.05 were considered as an associated factor. Finally, responses to the open-ended question on ways best to deal with loneliness within the Assyrian community were thematically analysed, guided by Braun and Clarke's (2006) framework [23].

Results

Table 1 reports on the descriptives for all study participants categorised into those born in Australia and those born overseas.

A total of 276 individuals partially completed the survey between September 2023 to July 2024, and of these 210 had fully completed the survey. From the total completed surveys, 106 (50.5%) were born overseas and 27.9% of this subgroup chose to complete the survey in Arabic. The mean number of years residing in Australia for those born overseas was 24.7 years (SD = 27.9). For both subgroups, females outnumbered males, with 95 (70.4%) Australian born females and 87 (57.2%) females indicating they were born overseas. The majority of participants in both subgroups indicated being Christian with some participants specifying their denomination as noted in Table 1. Participants born overseas were older which was statistically significant, t (274) = 8.37, $p <.001$. Marital status was significantly different between first and second generation Australians, χ^2 (2, $N = 260$) = 30.27, $p <.001$. Specifically, a higher percentage of individuals born in Australia were single (55.8%) compared to those not born in Australia (22.9%). Conversely, a higher percentage of individuals not born in Australia were married or co-habiting (71.8%) compared to those born in Australia (42.6%). First generation Australian Assyrians had a significantly higher number of children than those born in Australia, t (251) = 8.77, $p <.001$. Across both subgroups, most had a tertiary education (75.2% of Australian born and 64.1% of those born overseas). A significant association was noted between the employment and Assyrian subgroups, χ^2 (3, $N = 260$) = 45.94, $p <.001$. Specifically, a higher percentage of individuals born in Australia were students (37.2%) compared to those not born in Australia (9.2%). Conversely, a higher percentage of individuals not born in Australia were unemployed (16%) or in the "other" category (15.3%) compared to those born in Australia (5.4% and 0.8%, respectively). The average score on the UCLA Loneliness Scale was 46.7 for those born in Australia which was significantly higher than those born overseas whose average score was 42.1 (t (208) = −2.08, $p =.039$).

Table 2 reports the unadjusted and adjusted models for the Australian born subgroup.

For the Australian born Assyrian group, higher levels of loneliness were associated with poorer self-reported general health, younger age, being female, those who were married, and those whose employment status was other (homemaker, retired). Interestingly, loneliness levels were lower amongst the widowed/or divorced compared with those single in this subgroup (reference category). Poor self-reported general health, shorter during of residence in Australia, being a student and those who reported being Christian had higher levels of loneliness among the overseas born Assyrian group.

Table 3 reports the findings of the unadjusted and adjusted models for loneliness for the Assyrians born overseas.

Table 2 Unadjusted and adjusted models of loneliness in Assyrians born in Australia

Born in Australia

Variables	Unadjusted models						Adjusted models					
	Unstandardised beta Coefficient			Standardised beta Coefficient			Unstandardised beta Coefficient			Standardised beta Coefficient		
	b	95% CI	P-value	b	95% CI	P-value	b	95% CI	P-value	b	95% CI	P-value
General Health	−5.06	[−7.24, −2.88]	< 0.00	−0.36	−0.52, −0.21	< 0.001	−3.73	[−5.96, −1.51]	< 0.01	−0.27	−0.42, −0.11	0.001
Age	−1.11	[−1.80, −0.429]	< 0.01	−0.86	−1.39, −0.33	< 0.01	−1.09	[−1.90, −0.277]	< 0.05	−0.84	−1.47, −0.21	0.008
Gender: Woman (Ref = Man)	10.79	[2.78, 18.79]	< 0.01	0.67	0.17, 1.16	0.008	6.84	[−0.32, 13.99]	0.61	0.42	−0.02, 0.87	0.061
Marital Status (Ref = Single)												
Married/co-habiting	−6.54	[−12.83, −0.255]	< 0.05	−0.40	−0.79, −0.02	0.041	−4.46	[−9.99, 1.07]	0.11	−0.28	−0.62, 0.07	0.114
Divorced/widowed	18.86	[12.91, 24.81]	< 0.00	1.17	0.80, 1.53	< 0.001	25.4	[5.88, 44.91]	< 0.05	1.57	0.36, 2.78	0.011
Number of children	−5.17	[−11.63, 1.30]	0.180	−0.44	−1.00, 0.11	0.117	1.2	[−3.89, 6.28]	0.65	0.10	−0.33, 0.54	0.645
Education (Ref = Secondary or less)												
Tertiary	−2.84	[−10.23, 4.54]	0.450	−0.18	−0.63, 0.28	0.45	2.86	[−4.01, 9.73]	0.42	0.18	−0.25, 0.60	0.415
Employment Status (Ref = unemployed)												
Employed	0.883	[−15.58, 17.35]	0.920	0.05	−0.96, 1.07	0.916	0.41	[−11.62, 12.43]	0.95	0.03	−0.72, 0.77	0.947
Student	−4.74	[−20.97, 11.50]	0.570	−0.29	−1.30, 0.71	0.567	2.8	[8.47, 14.06]	0.63	0.17	−0.52, 0.87	0.626
Other	−21.14	[−36.84, −5.45]	< 0.01	−1.31	−2.28, −0.34	< 0.01	−14.75	[−29.03, −0.48]	< 0.05	−0.91	−1.79, −0.03	0.043
Religion[a] (Ref = Atheist/Agnostic/Other)												
Christian	8.48	[−7.63, 24.59]	0.300	0.52	−0.47, 1.52	0.302	8.94	[−10.92, 28.80]	0.38	0.55	−0.68, 1.78	0.378

[a]The religion variable was collapsed into Atheist/Agnostic/Other which is the reference category

Once all covariates were controlled for, poorer self-reported general health and younger age continued to remain significantly associated with greater loneliness in the second-generation Assyrians while being divorced was associated with lower loneliness. For the Assyrians born overseas (first-generation), poorer general self-reported health, shorter during of time in Australia and identifying as Christian continued to remain significant for higher levels of loneliness. Additionally, the adjusted model noted that older age, and being female were also significantly associated with greater loneliness levels in this sub-group. Finally, across all models findings from standardised beta coefficients were consistent with unstandardised beta coefficients.

Table 4 summarises the responses to the open-ended question asking participants to list all the ways and or activities that could assist Assyrian people experiencing loneliness.

Following a thematic analysis of responses, it was clear that responses fell into one of two primary intervention levels, those that aimed at intervening at an individual level, with suggestions offered such as encouraging a healthy mindset through promoting work or exercising and volunteering. The second type were activities that were aimed at intervening or delivered at a community level which were by far the most common. These included activities or events that had strong cultural and/or nationalistic focus such as Assyrian language classes, bring back traditional crafts and knowledge, history lessons or bible classes. Interestingly when discussing activities, the two age groups that were most frequently mentioned as needing additional assistance were youth and the elderly.

Discussion

Loneliness is increasingly being recognised as a significant public health challenge, with countries such as United Kingdom, United States of America, Norway and Japan establishing ministerial appointments and or strategies to address the 'epidemic' of loneliness [24]. Migrants, particularly those who originate from collectivist societies are a group that often find themselves in countries where individualism is favoured. Such changes in societal expectations can influence how these communities operate and function and potentially drive experiences of loneliness [9]. Examining loneliness in the Australian Assyrian population is of interest given their prolonged experiences of persecution and the multiple waves of displacement they have experienced and continue to do so [25]. Consequently, this study sought to investigate loneliness and its associated factors in two subgroups of Australian Assyrians, those born overseas (first generation) and those born in Australia (second generation). Broadly, the findings from

the survey partially supported our predicted hypotheses. For example, we found that between 29.25% of first generation Australian Assyrians to 43.27% of second generation Australian Assyrians had moderately high to high levels of loneliness, which are figures that are well above the rate of 16% of the general Australian sample with clinically significant levels of loneliness reported by the Australian Institute of Health and Welfare [26]. This was consistent with our hypothesis, however, it should be noted that differing scales of measurement between the two samples precluded formal testing. Of interest is our finding that second generation Australian Assyrians had significantly higher rates of loneliness when compared with their overseas born Assyrians which was not as expected. While research has previously noted the important relationship between acculturation and mental health outcomes amongst migrant groups [27], the link with loneliness is emerging. Our findings suggest that loneliness may be subject to a more complex interplay of generational factors. Indeed, in an Australian based study accessing national survey data on mental health and wellbeing, first generation migrants from non-English speaking backgrounds were found to have a lower prevalence of common mental disorders compared to the Australian-born population but that this observation did not occur in those born in Australia (second generation) of migrant parents [28]. However, mental health-related disability as measured by the World Health Organization Disability Assessment Schedule 12-item version (WHO-DAS-12) was found to be higher amongst first generation migrants from non-English speaking backgrounds compared to the Australian-born group [28], highlighting importance of taking a nuanced approach to understanding the role migration on mental health and loneliness.

When examining factors associated with higher levels of loneliness in the adjusted models, there were some interesting patterns. Firstly, as predicted, poorer self-reported general health was significantly associated with higher levels of loneliness in both first- and second-generation Assyrians. The association with self-reported general health is consistent with previous findings that have noted the inverse relationship between good physical health and loneliness [29]. Similarly, shorter length of stay in first generation Assyrians was also noted to be associated with higher loneliness, a finding consistent with other studies on loneliness amongst migrants [30]. However, the finding that those respondents who identified as Christians had higher levels of loneliness comparatively with the reference group of atheist/agnostic in the first-generation Australian Assyrians is unexpected and bears cautious unpacking. On first glance it would appear that such a finding is in direct contrast with existing research that points to the important positive role religion can play in the lives of migrant individuals from

Slewa-Younan *et al. BMC Public Health*   (2025) 25:3297

Page 8 of 11

Table 3 Unadjusted and adjusted models of loneliness for Assyrians born overseas

Born Overseas

Variables	Unadjusted models						Adjusted models					
	Unstandardised beta Coefficient			Standardised beta Coefficient			Unstandardised beta Coefficient			Standardised beta Coefficient		
	b	95% CI	P-value	b	95% CI	P-value	b	95% CI	P-value	b	95% CI	P-value
General Health	−4.21	[−6.46,−1.93]	<0.00	−0.36	−0.52, −0.21	<0.00	−3.57	[−6.35,−1.15]	<0.01	−0.27	−0.45, −0.08	<0.01
Length in Australia	−0.078	[−0.119,−0.036]	<0.00	−0.13	−0.21, −0.06	<0.00	−0.08	[−0.12,−0.04]	<0.00	−0.14	−0.21, −0.07	<0.00
Age	0.052	[−0.127,0.231]	0.57	0.04	−0.10, 0.18	0.571	0.18	[0.00,0.35]	<0.05	0.14	0.00, 0.27	<0.05
Gender: Woman (Ref=Man)	4.93	[−0.799,10.66]	0.09	0.30	−0.05, 0.66	0.092	5.67	[0.34,10.99]	<0.05	0.35	0.02, 0.68	<0.05
Marital Status (Ref=Single)												
Married/co-habiting	−6.3	[−13.32,0.716]	0.08	−0.39	−0.82, 0.04	0.078	−4.25	[−11.61,3.10]	0.28	−0.26	−0.72, 0.19	0.257
Divorced/widowed	−6.05	[−21.42,9.33]	0.44	−0.37	−1.32, 0.58	0.441	−4.80	[−17.73,8.13]	0.47	−0.30	−1.10, 0.50	0.467
Number of children	−1.5	[−3.04,0.046]	0.06	−0.13	−0.26, 0.00	0.057	−1.50	[−3.61,0.62]	0.17	−0.13	−0.31, 0.05	0.165
Education (Ref=Secondary or less)												
Tertiary	−3.22	[−9.44,3.00]	0.31	−0.20	−0.58, 0.19	0.31	−0.11	[−6.16,5.94]	0.97	−0.01	−0.38, 0.37	0.972
Employment Status (Ref=unemployed)												
Employed	−1.25	[−12.13,9.63]	0.82	−0.08	−0.75, 0.60	0.822	1.58	[−11.13,14.29]	0.81	0.10	−0.69, 0.88	0.807
Student	−9.22	[−17.12,−1.31]	0.02	−0.57	−1.06, −0.08	0.022	−3.88	[−13.97,6.20]	0.45	−0.24	−0.86, 0.38	0.45
Other	−7.15	[−16.98,2.68]	0.15	−0.44	−1.05, 0.17	0.154	−1.90	[−11.65,7.85]	0.7	−0.12	−0.72, 0.49	0.703
Religion[a] (Ref=Atheist/Agnostic/Other)												
Christian	15.92	[8.23,23.60]	<0.00	0.98	0.51, 1.46	<0.00	14.44	[4.67,24.21]	<0.01	0.89	0.29, 1.50	<0.01

[a]The religion variable was collapsed into Atheist/Agnostic/Other which is the reference category and Christians

Table 4 Suggested approaches to dealing with loneliness in Assyrian community

Category	Examples and quotes
Social Infrastructure	'Building Fairfield or Fairfield heights boulevard into being a "Little Assyria" somewhat like a Chinatown (e.g. Cabramatta) to have a place where like-minded Assyrians can gather to share their rich heritage and culture, business and food' (Female, 43)
	"Assyrian retirement village, Assyrian social groups and schools in Camden and Campbelltown (two suburbs in outer Sydney) Assyrian restaurants around Campbelltown." (Female, age not provided)
	"I feel Assyrians need to meet and socialise with other Assyrians in a non-traditional, typical Assyrian setting i.e. party, weddings. I don't know what the settings could be or look like, but something not your typical. This can allow for a more different approach to socialising and sharing ideas and thoughts." (Male, 39)
Nationalistic Focused Activities	"More Assyrian sporting activities (similar to the soccer cup), Assyrian media and news to be on the tv to (enable) access to more activity and daily news in understandable language so they can feel involved…" (Male, 52)
	"Assyrian Scouts could be good idea, youth parties, (like the ones used to be set up the Assyrian school for students but got cancelled, they were called disco something) charities that the youth participates in as volunteers to go around and do good work…., youth retreats, fun events, retreats to places like royal Easter show as Assyrian youth group, (all this could be done by having scouts system to feel like part of something have merchandise), if not scouts, something similar. It needs to plan many events like swimming pool days and whatever there is picnic days, beach days." (Male, age not provided)
	"Assyrian classes to teach youth how to cook Assyrian meals and other traditional things such as sew, pray, dance." (Female, age not provided)
	"Storytelling especially for older Assyrians, learning to read/write/speak Assyrian especially for Assyrians who feel that they are a bit more removed from their Assyrian culture." (Male, 24)
	"Assyrian classes to learn about our history." (Female, 18)
Religious Focussed Activities	"Being active members in the church, fellowshipping with other Assyrian believers and having faith in Christ." (Male, 22)
	"Put your trust and faith in God, make your requests known to God. Attend church regularly and speak to people. You will start to build genuine friendships. It might take time, but good things take time to happen." (Male, 24)
	"Keep an open mind; often we are not alone, we think we are and we isolate ourselves. Attend church. Develop a relationship with God. People try to find tangible ways to fix their problems and completely disregard the Creator, our Shepherd, He who knows us best of all. Keep a positive mindset. If you give up and stop trying, you eliminate all hope." (Female, 19)
Encourage social proactivity	"Group exercise classes (rehab exercises), group gardening, group shopping (shuttle service picking people up and taking us to the shops together)…" (Female, 77)
	"Activities that aren't related to a club or the church, groups focused on hobbies or physical exercise instead of traditional customs (sic) of women only going to volunteer at church for their social interactions…" (Female, 36)
	"More physical activities together and social groups. Walking groups etc.…" (Male, 34)
Developing Healthy Mindsets	"Explaining and showing it's all about mindset and perspective on life. You only get out as much as you put in." (Male, age not provided)
	"Work(ing) or volunteering…" (Female, 56)
	"Get a hobby, make friends, participate in group activities…" (Female, age not provided)
Mental health Education and Peer Support	"Assyrian speaking peer support workers, easy access to interpreters, community support groups, The recognition of the Assyrian people in employment, church leaders collaborating with mainstream services e.g. mediation services, education for church leaders and community groups to assist in dismantling the stigma of mental health, education around family violence and mental health and doing so in young people…" (Female, age not provided)
	"Education about mental health to reduce stigma and improve understanding of its complexity, education for building healthy relationships as some never had this modeled by their families, emotional regulation strategies (understanding how to cope and work through feelings of shame, guilt etc.), community groups with others of shared goals/challenges…" (Female, 29)
	"Link them with community support group. Provide them counselling service. Hold community forums or information sessions to raise awareness about MH (mental health) issues and managing emotions…" (Male, 44)

serving as an anchor to pre-migration identity through to offering meaning making and healing to those who have been exposed to trauma and pain [31]. However, this is more likely to be associated with individual's religiosity levels, a complex construct which cannot be captured by only recording religious affiliation [32, 33]. Similarly, our findings from the adjusted model demonstrate a complex interplay between age and loneliness across the generation cohorts. Amongst second-generation Assyrian Australians, younger age was associated with greater levels of loneliness, whereas within the first-generation older age was associated with increased loneliness in the adjusted model. Interestingly, these two age cohorts were also frequently mentioned in the thematic analysis of the open ended question on ways to address loneliness, consistent with past investigations that have demonstrated the nuanced dynamics between age, migration and loneliness [34].

Study implications and recommendations

When considering the responses to dealing with loneliness, our findings provide some insights and areas for targeted interventions. For example, it is not surprising that most suggested approaches involved community-based activities that had an educational element aimed at preserving language and heritage. While the Australia government first established the ethnic schools' program in 1981 [35], migrant communities recognised

the importance of informal language classes as a space for children to learn their heritage languages and maintain their cultural identity decades long before with the first Assyrian language classes were held in Australia as early as 1974 [36]. Such activities not only support social cohesion but promote skills such as bilingualism, which have benefits for the wider Australian community [35]. The establishment of the highly successful St. Hurmizd Assyrian Primary School, in 2002 and St. Narsai Assyrian Christian College in 2006, both faith-based Christian co-educational Schools, affiliated with the Holy Apostolic Assyrian Church of the East, highlight the important role such environments and activities play in migrant communities [37]. Our findings highlight a continued appetite for such activities, particularly amongst the missing middle (older adult Assyrians). Finally, targeted programs aimed at improving mental health education and reducing stigma were frequently mentioned, with efforts to address this already underway, albeit in a broad-brush approach [38, 39]. Nonetheless, ongoing work is needed, particularly when developing mental health and peer support programs. The Assyrian community members and leaders are experts on their needs and as such should be embedded in the development and delivery of mental health initiatives. This builds trust and relevance, necessary to any work in the community mental health space [7]. For policy makers, it is essential to recognise loneliness as a public health issue within migrant communities and allocate resources for culturally tailored interventions. Supporting the development of ethnic-specific infrastructure and services is not merely an act of cultural preservation, it is a public health policy because it fosters social cohesion, mitigates psychosocial stressors such as loneliness, and enhances wellbeing within diaspora populations.

Study limitations

This study has a number of limitations that require noting. Firstly, being an online self-report cross-sectional survey, this study design can be limited by factors such as recall bias and temporal ambiguity. Thus, the possibility that the findings are impacted by under-reporting and social desirability cannot be discounted. Secondly, despite noting a number of associations with loneliness in our subgroups, these are only observational with a longitudinal design required to further test progression and development of these relationships. Thirdly, despite significant efforts to promote the study within the community in order to have a broad representation of age and gender, those born in Australia were notably younger females and both sub-groups had higher levels of education. Notwithstanding these limitations, this study also has a number of strengths. Firstly, to the best of our knowledge, the first of its kind worldwide to examine loneliness in a large sample of Assyrians, a group that has faced persecution and displacement for many years and is increasingly being resettled in large numbers in Western nations. Secondly, the use of a validated scale to measure loneliness further adds weight to the findings. Finally, by offering the survey English and Arabic, the language most overseas born participants would have received formal education in, those impacted by limited English literacy were not precluded.

Conclusion

The Australian-Assyrian diaspora represents a migrant group on which there is little published literature regarding their mental health and wellbeing. Findings from this study demonstrated concerning rates of loneliness across both first- and second-generation Australian Assyrians. Given loneliness represents a modifiable factor that can influence health outcomes, it is imperative that targeted programs be developed for this and other migrant communities. Our findings provide the first steps in this direction.

Data availability
The data sets are not publicly available as they contain information that could potentially re-identify individuals but are available from S.S.-Y. upon reasonable request and with relevant ethical approval.

Declarations

Ethics approval and consent to participate
Research was carried out in accordance with the Declaration of Helsinki and was approved by the Human Research Ethics Committee of Western Sydney University (approval number: H15304). All participants provided a written informed consent.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

References

1. Gow G, Isaac A, Gorgees P, Babakhan M, Daawod K. Assyrian community capacity Building in Fairfield City. Penrith: University of Western Sydney; 2005.
2. Unrepresented Nations and Peoples Organization. Assyria. (n.d.). https://unpo.org/assyria/. Accessed 17 Oct 2024.
3. Kassem N, Jackson M. Cultural trauma and its impact on the Iraqi Assyrian experience of identity. Soc Identities. 2020;26(3):388–402. https://doi.org/10.1080/13504630.2020.1762557.
4. Schmoller A. Middle Eastern minorities in diaspora. In: Routledge handbook of minorities in the Middle East. Routledge. 2019 pp 351–369.
5. Australian Bureau of Statistics. Cultural diversity: Census. 2022. https://www.abs.gov.au/statistics/people/people-and-communities/cultural-diversity-census/2021. Accessed October 16 2024.
6. 2021 Census of Population and Housing. 2022. Accessed 17 Oct 2024.
7. Slewa-Younan S, Krstanoska-Blazeska K, Renzaho A, Blignault I, Li B, Reavley N. Understanding mental health and stigma in Congolese, Arabic-speaking, and Mandarin-speaking communities. Mental Health Australia; 2022.
8. Hutten E, Jongen EMM, Hajema K, Ruiter RAC, Hamers F, Bos AER. Risk factors of loneliness across the life span. J Soc Personal Relationships. 2022;39(5):1482–507. https://doi.org/10.1177/02654075211059193.
9. Nguyen TP, Al Asaad M, Sena M, Slewa-Younan S. Loneliness and social isolation amongst refugees resettled in high-income countries: a systematic review. Soc Sci Med. 2024;360:117340. https://doi.org/10.1016/j.socscimed.2024.117340.
10. Leigh-Hunt N, Bagguley D, Bash K, Turner V, Turnbull S, Valtorta N, Caan W. An overview of systematic reviews on the public health consequences of social isolation and loneliness. Public Health. 2017;152:157–71. https://doi.org/10.1016/j.puhe.2017.07.035.
11. Lu M, Bronskill SE, Strauss R, Boblitz A, Guan J, Im JHB, et al. Factors associated with loneliness in immigrant and Canadian-born older adults in Ontario, Canada: a population-based study. BMC Geriatr. 2023;23(1):380. https://doi.org/10.1186/s12877-023-04092-w.
12. Ng CF, Northcott HC. Living arrangements and loneliness of South Asian immigrant seniors in Edmonton. Can Ageing Soc. 2015;35(3):552–75. https://doi.org/10.1017/S0144686X13000913.
13. Ali SH, Islam T, Pillai S, Kalasapudi L, Mammen S, Inala S, et al. Loneliness and mental health outcomes among South Asian older adult immigrants in the united states: a cross-sectional study. Int J Geriatr Psychiatry. 2021;36(9):1423–35. https://doi.org/10.1002/gps.5549.
14. Salway SS, Preston E, Booth L, Zubair A, Victor M, Raghavan C, Raghu. Reducing loneliness among migrant and ethnic minority people: a participatory evidence synthesis. Public Health Res. 2020;8(10):1–246.
15. Russell D, Peplau LA, Ferguson ML. Developing a measure of loneliness. J Pers Assess. 1978;42(3):290–4. https://doi.org/10.1207/s15327752jpa4203_11.
16. Perry GR. Loneliness and coping among tertiary-level adult cancer patients in the home. Cancer Nurs. 1990;13(5):293–302.
17. Al-Omari KH, Jaradat A. Exploring the relationship between self-disclosure and loneliness among a sample of Yarmouk university students. E J Al-Quds Open Univ Educational Psychol Res Stud. 2013;6:293–326.
18. Nazzal FI, Cruz O, Neto F. Psychometric properties of the satisfaction with love life among Palestinian college students. Interpersona: An International Journal on Personal Relationships. 2019. https://doi.org/10.5964/ijpr.v13i1.347.
19. StataCorp. Stata statistical software: release 18. College station. TX: StataCorp LLC; 2023.
20. McCall GS, Villafranca A. Methods you can count on: a simulation experiment showing the advantages generalized linear modeling (GLM) over the linear regression of log-transformed count data. J Archaeol Sci Rep. 2024;53:104377. https://doi.org/10.1016/j.jasrep.2024.104377.
21. Hardin JW, Hilbe JM. Generalized linear models and extensions. Stata; 2007.
22. Vatcheva KP, Lee M, McCormick JB, Rahbar MH. Multicollinearity in regression analyses conducted in epidemiologic studies. Epidemiol (Sunnyvale). 2016;6(2). https://doi.org/10.4172/2161-1165.1000227.
23. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Res Psychol. 2006;3(2):77–101. https://doi.org/10.1191/1478088706qp063oa.
24. Jentoft EE, Sandset T, Haldar M. Problematizing loneliness as a public health issue: an analysis of policy in the United Kingdom. Crit Policy Stud. 2024;18. https://doi.org/10.1080/19460171.2024.2306240.
25. Majalla R. Tragic Tale: How Assyrians Vanished from Syria. 2023. https://en.majalla.com/node/292611/politics/tragic-tale-how-assyrians-vanished-syria.
26. Australian Institute of Health and Welfare. Loneliness in Australia: 2022. https://www.aihw.gov.au/mental-health/topic-areas/social-isolation-and-loneliness. Accessed 13th Mar 2025.
27. Choy B, Arunachalam K, Gupta S, Taylor M, Lee A. Systematic review: acculturation strategies and their impact on the mental health of migrant populations. Public Health Pract (Oxf). 2021;2:100069. https://doi.org/10.1016/j.puhp.2020.100069.
28. Liddell BJ, Nickerson A, Sartor L, Ivancic L, Bryant RA. The generational gap: mental disorder prevalence and disability amongst first and second generation immigrants in Australia. J Psychiatr Res. 2016;83:103–11. https://doi.org/10.1016/j.jpsychires.2016.08.011.
29. Hawkley LC, Cacioppo JT. Loneliness matters: a theoretical and empirical review of consequences and mechanisms. Ann Behav Med. 2010;40(2):218–27. https://doi.org/10.1007/s12160-010-9210-8.
30. Wu Z, Penning M. Immigration and loneliness in later life. Aging Soc. 2015;35(1):64–95. https://doi.org/10.1017/S0144686X13000470.
31. Gemar A. Religion and loneliness: investigating different aspects of religion and dimensions of loneliness. Religions. 2024;15:488. https://doi.org/10.3390/rel15040488.
32. Papaleontiou-Louca E. Religiosity: is it mainly linked to mental health or to psychopathology?? Religions. 2024;15(7):811.
33. Sedikides C. Why does religiosity persist?? Pers Soc Psychol Rev. 2009;14(1):3–6. https://doi.org/10.1177/1088868309352323.
34. Delaruelle K. Migration-related inequalities in loneliness across age groups: a cross-national comparative study in Europe. Eur J Ageing. 2023;20(1):35. https://doi.org/10.1007/s10433-023-00782-x.
35. Cardona B, Noble G, Di Biase B. Community languages matter: Challenges and opportunities facing the community languages program in NSW. Western Sydney University; 2008.
36. Special Broadcasting Service. Assyrian: Fifty years of language and culture preservation marked. 2024. https://www.sbs.com.au/language/assyrian/en/podcast-episode/fifty-years-of-language-and-culture-preservation-marked/bld5v5h8e. Accessed 13th Mar 2025.
37. Hegarty S. Australia's only Assyrian school helps refugee children thrive. The Religion and Ethics Report. ABC Radio National; 2017.
38. Slewa-Younan S, Guajardo MGU, Mohammad Y, Lim H, Martinez G, Saleh R, Sapucci M. An evaluation of a mental health literacy course for Arabic speaking religious and community leaders in australia: effects on posttraumatic stress disorder related knowledge, attitudes and help-seeking. Int J Ment Health Syst. 2020;14:69. https://doi.org/10.1186/s13033-020-00401-7.
39. Slewa-Younan S, McKenzie M, Thomson R, Smith M, Mohammad Y, Mond J. Improving the mental wellbeing of Arabic speaking refugees: an evaluation of a mental health promotion program. BMC Psychiatry. 2020;20(1):314. https://doi.org/10.1186/s12888-020-02732-8.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.