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The physical and mental health problems of refugee and migrant fathers: findings from an Australian population-based study of children and their families

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ABSTRACT

Objectives The aim of this study was to report on the physical and mental health of migrant and refugee fathers participating in a population-based study of Australian children and their families.

Design Cross-sectional survey data drawn from a population-based longitudinal study when children were aged 4–5 years.

Setting Population-based study of Australian children and their families.

Participants 8137 fathers participated in the study when their children were aged 4–5 years. There were 131 (1.6%) fathers of likely refugee background, 872 (10.7%) fathers who migrated from English-speaking countries, 1005 (12.4%) fathers who migrated from non-English-speaking countries and 6129 (75.3%) Australian-born fathers.

Primary outcome measures Fathers' psychological distress was assessed using the self-report Kessler-6. Information pertaining to physical health conditions, global or overall health, alcohol and tobacco use, and body mass index status was obtained.

Results Compared with Australian-born fathers, fathers of likely refugee background (adjusted OR(aOR) 3.17, 95% CI 2.13 to 4.74) and fathers from non-English-speaking countries (aOR 1.79, 95% CI 1.51 to 2.13) had higher odds of psychological distress. Refugee fathers were more likely to report fair to poor overall health (aOR 1.95, 95% CI 1.06 to 3.60) and being underweight (aOR 3.49, 95% CI 1.57 to 7.74) compared with Australian-born fathers. Refugee fathers and those from non-English-speaking countries were less likely to report light (aOR 0.25, 95% CI 0.15 to 0.43, and aOR 0.30, 95% CI 0.24 to 0.37, respectively) and moderate to harmful alcohol use (aOR 0.04, 95% CI 0.10 to 0.17, and aOR 0.14, 95% CI 0.10 to 0.19, respectively) than Australian-born fathers. Finally, fathers from non-English-speaking and English-speaking countries were less likely to be overweight (aOR 0.62, 95% CI 0.51 to 0.75, and aOR 0.84, 95% CI 0.68 to 1.03, respectively) and obese (aOR 0.43, 95% CI 0.32 to 0.58, and aOR 0.77, 95% CI 0.61 to 0.98, respectively) than Australian-born fathers.

Strengths and limitations of this study

► To our knowledge, this is the first population-based birth cohort study in a high-income country to identify and report mental and physical health outcomes for fathers of likely refugee background.
► The design of the study and size of the sample enabled us to compare mental and physical health outcomes and health behaviours in fathers of refugee background with Australian-born fathers and migrant fathers of non-English-speaking and English-speaking backgrounds.
► We used a proxy measure to ascertain refugee background. While this may have resulted in some misclassification, confirmation of refugee status is rarely possible in administrative datasets. Even when visa status is collected, it is not necessarily a reliable indicator.
► Migrant families of non-English-speaking backgrounds were under-represented in the study and were more likely to be lost to follow-up. The sample is likely to be representative of more socially and economically advantaged families with higher levels of English proficiency.

Conclusion Fathers of refugee background experience poorer mental health and poorer general health than Australian-born fathers. Fathers who have migrated from non-English-speaking countries also report greater psychological distress than Australian-born fathers. This underscores the need for primary healthcare services to tailor efforts to reduce disparities in health outcomes for refugee populations that may be vulnerable due to circumstances and sequelae of forced migration and to recognise the additional psychological stresses that may accompany fatherhood following migration from non-English-speaking countries. It is important to note that refugee and migrant fathers report less alcohol use and are less likely to be overweight and obese than Australian-born fathers.

Migration around the world is at its highest ever recorded, with 244 million individuals crossing international borders in 2015.[1] While many people willingly leave their home country for education and employment opportunities, there are currently over 65 million people who have been forcibly displaced from their homes due to conflict, persecution and human rights abuse.[2] Many of these displaced people will seek protection from another country as a refugee. The process of settlement and acculturation can be a time of significant stress for both migrants and refugees. Common sources of stress include learning a new language, finding employment and housing, navigating unfamiliar health and education services, and adjusting to changing family relationships.[3–6] For people of refugee background, these stresses may be compounded by having endured traumatic events, such as experiencing or witnessing harm, death or threats to others; family separation; time spent in detention and refugee camps; and long periods of limited access to basic needs such as food, water, shelter and safety.[3 6]

For people of migrant and refugee background, settlement and acculturative experiences can increase the risk of physical and mental health difficulties. For instance, a meta-analysis of 35 studies reported prevalence estimates for depression and anxiety of approximately 20% among migrants and 40% among refugees. Symptoms may persist for many years post-settlement,[7 8] leading to concerns about potential intergenerational impact within families. Internationally, there has been considerable interest in the mental health of women of refugee and migrant backgrounds during and after pregnancy.[9 10] Australian research has shown that women of refugee and migrant background are more likely to experience depressive symptoms after childbirth, compared with women born in Australia.[11–13] There is also evidence that women of refugee and migrant background have higher rates of stillbirth, foetal death in utero and perinatal mortality compared with Australian-born women.[14] This has also been demonstrated internationally for other high-income countries.[15]

Much less is known about fathers of refugee and migrant background. The focus on fathers of young children is critical given their important role in supporting their families to adjust to life in their new country[5 16] and to the health, well-being and development of their children.[17] Mental health problems such as anxiety and depression affect 10%–12% of fathers in the general population in the early years of parenting.[18–22] Although the prevalence of mental health problems is likely to be higher among fathers of refugee or migrant backgrounds, research in this area is scarce. A study conducted almost a decade ago found that migrant fathers can feel undermined in their traditional role as the head of the household when they experience difficulty finding suitable employment. This may lead to migrant fathers feeling alienated and disrespected at a broader societal level and within their own families.[5]

While studies of refugee men more broadly have reported high levels of post-traumatic, depressive and anxiety symptoms,[7 23–25] as well as musculoskeletal, respiratory, cardiovascular and infectious diseases,[4 24 26] few studies have focused specifically on fathers of refugee background. In a study of 29 refugee fathers, resettled in the Netherlands, 86% reported symptoms of post-traumatic stress disorder (PTSD).[27] In another study of 50 refugee fathers from Vietnam, resettled in Norway,[17] approximately 28% met the full or partial criteria for PTSD on arrival. Approximately 23–24 years after arrival, 15% met the full or partial criteria for PTSD, and 20% met the clinical cut point on the General Symptom Inventory, which is indicative of a probable psychiatric disorder. No studies have reported on the physical health or health behaviours (ie, cigarette smoking, alcohol use) of refugee fathers.

Taken together, this small but important body of research suggests that fathers of migrant and refugee background might be at risk for increased mental and physical health problems. Determining the extent to which these fathers experience physical and mental health problems is critical to the development of health policy and services to better meet their needs in the critical early years of their children's lives. This is particularly important in Australia given that in 2015–2016, Australia admitted around 190 000 permanent migrants (mainly for skills and labour) and over 17 500 on humanitarian (mainly refugees) grounds. Furthermore, our previous research has shown that when health professionals interact with refugee fathers, they are unlikely to inquire about the health and well-being needs of men themselves, therefore missing opportunities to provide care and support.[28]

The objective of this paper was to investigate the mental and physical health and health behaviours of fathers of refugee and migrant backgrounds in an existing population-based sample of over 8000 Australian children (aged 4–5 years) and their families participating in the Longitudinal Study of Australian Children (LSAC). Although LSAC was not designed specifically to investigate the needs of refugee and migrant families, rich data on psychological distress, physical health problems, body mass index, alcohol use and cigarette smoking are available. We draw on the data available when children were aged 4–5 years—a critical and formative time during early childhood. The specific aim of the current study was to compare the mental and physical health and health behaviours of refugee fathers and those who had migrated from an English-speaking and non-English-speaking country to Australian-born fathers.

METHOD
Study design
Data were drawn from two cohorts of children and their families participating in Growing up in Australia: The Longitudinal Study of Australian Children. The design and field methods have been described elsewhere.[29–34] Ethics approval was obtained from the Australian Institute of Family Studies Human Research Ethics Committee

and Australian states and territories education departments. Briefly, both cohorts were recruited in 2004. The birth cohort (B-cohort) was recruited when the children were less than 12 months of age, and the kindergarten cohort (K-cohort) was recruited when the children were aged 4–5 years. Sampling details are outlined below. Each cohort has been followed up every 2 years. As a result, the age of the children in the two cohorts began to overlap at wave 3 when the B-cohort children were 4–5 years of age. The present study used data from the overlapping cohorts at age 4–5 (B-cohort wave 3, K-cohort wave 1). Preliminary analysis of the data failed to reveal any significant cohort effects[29]; therefore, both cohorts were combined for this paper.

Sampling was based on a two-stage process. First, approximately 10% of all Australian postcodes were selected. Second, a number of children proportional to population size for each postcode were randomly selected using the Australian universal health insurance database (Medicare). There were 5107 children recruited into the B-cohort (64% response rate) and 4983 into the K-cohort (59% response rate). The sample was broadly representative of children and parents in the Australian population; however, there was under-representation of mothers who had not completed year 12 of their secondary education, children of non-English-speaking background and single parent families in both cohorts.[33]

The cohorts were reassessed every 2 years via a combination of face-to-face and computer-assisted interviews, self-complete questionnaires, direct assessment of children's functioning, time use diaries and linking to administrative data. To increase the involvement of parents from non-English-speaking backgrounds at wave 3 (B-cohort) and wave 1 (K-cohort), telephone interviews were conducted in a language other than English with 97 parents.[32] Fifty-eight interviews were interpreted by a family member or friend, 31 were interpreted by an Australian Bureau of Statistics interviewer fluent in the relevant language and eight interviews were conducted using an accredited interpreter. The most common languages requiring an interpreter were Arabic, Vietnamese and Cantonese.

The sample size for the B-cohort and K-cohort when children were aged 4–5 years was 4386 and 4983, respectively.

Study sample

The analytical sample for the current study was biological, step, adoptive or foster fathers participating in the B-cohort and K-cohort. Data collected from fathers at the overlapping cohort stage when all children were aged 4–5 years (B-cohort at wave 3 and K-cohort at wave 1) was used. Previous analyses revealed no significant cohort effects.[29]

Country of birth was used to identify fathers who were Australian-born or born in another country. Fathers from English-speaking or predominantly non-English-speaking countries were identified using the official language of the country where they were born. To identify fathers of

likely refugee background, we used country of birth and year of arrival in Australia to allow for matching to Australian migration trends. Two different methods were used depending on the father's year of arrival into Australia. From 1990, data on migration to Australia through humanitarian grounds by country of birth and year of arrival were accessed from the Australian Government's Settlement Reporting Facility.[35] Likely refugee background was defined as those countries where at least two-thirds of migration from that country to Australia has been through the humanitarian stream. This approach was adopted from Gibson-Helm and colleagues[36] and an expert panel from the Murdoch Children's Research Institute and the Victorian Foundation for Survivors of Torture.[37 38] Prior to 1990, complete immigration information was not made accessible by the Australian Government. Therefore, the approach by Hugo[39] was applied. This uses data from the Australian Bureau of Statistics 2006 Census on birthplace contribution of refugee-humanitarian migrants to ascertain those countries contributing likely refugee background populations to Australia from 1946 through to the 1990s. The composition of migrant flows changed during the study period. For example, migrants from Asian countries (eg, China, India) have overtaken those from the UK and Europe. Refugees have been drawn from a variety of countries of origin, the main recent groups being from the Middle East, Asia and Africa. This information was taken into account in the algorithm used to ascertain fathers of likely refugee background.

Measures

Mental health

Psychological distress was assessed using the Kessler-6 (K6).[40] On a 5-point scale (0 none of the time to 4 all or most of the time), participants rated the extent to which they experienced feeling nervous, hopeless, restless or fidgety, extremely sad, worthless and like everything was an effort in the last 4 weeks. Two well-established cut points were used to describe the level of severity of distress. The symptomatic cut point was defined as a score of ≥8, indicating significant psychological distress. The clinical cut point was defined as a score of ≥13, indicating probable clinical diagnosis of a mental health condition. Cronbach's alpha for the current sample was 0.88 for fathers of refugee background, 0.81 for fathers of non-English-speaking background, 0.80 for fathers who migrated from English speaking countries and 0.83 for fathers born in Australia.

Physical health conditions

Participants indicated if they had any of the following conditions: sight and hearing problems, speech problems, difficulty learning or understanding, disfigurement or deformity, head injury, difficulty breathing and chronic pain.

Global or overall health

Global or overall health was rated on a 4-point scale ranging from 1 poor to 5 excellent, which was recoded

into a 3-point scale (1 poor to fair health, 2 good health, 3 excellent health) due to low frequency of responses for poor health.

Alcohol use

Participants reported on whether they drink alcohol and how much they drink a day (0 abstain, 1 occasional less than monthly, 2 light <2 drinks per day, 3 moderate 2–3 drinks per day, 4 hazardous 4–6 drinks per day, 5 harmful >6 drinks per day). This was recoded into three groups (1 abstain to occasional, 2 light, 3 moderate to harmful), given the low frequency of responses for abstaining and occasional drinking and moderate to hazardous levels of drinking.

Cigarette smoking

Participants reported whether they smoke tobacco cigarettes and how much they smoke a day. This was dichotomised into 1 smoking at least once a day and 2 do not smoke at all/less than once a day.

Body mass index (BMI) status

Based on participant self-report of height and weight, BMI was calculated as weight/height squared and expressed as kg/m^2. Participants were classified as being underweight (<18.5), overweight (≥25.0–29.9), obese (≥30.0) and within the normal range (18.5–24.9) according to current World Health Organization classification.[41]

Sociodemographic characteristics

Sociodemographic characteristics pertaining to fathers' age, country of birth, year of arrival in Australia, main language spoken at home, education, employment status, individual weekly gross income and number of children in the family were collected. Socioeconomic position (SEP) was rated using a derived variable from combined parental income, education and occupational prestige.[42] Families with a standardised score ≤25th percentile were classified as 'low' SEP, those ≥75th percentile were classified as 'high' SEP and the remainder were classified as 'medium' SEP. Continuous scores were used in all adjusted analyses. Socioeconomic status was also assessed using the Index of Relative Socio-economic Disadvantage (SEIFA[43]). Each participant was given an index score based on their postcode. The index is derived from levels of income, rates of unemployment and educational attainment within the postal area. The average score on the SEIFA is 1000, with higher scores indicating higher relative advantage for an area (ie, fewer individuals with low-income and unskilled occupations).[43]

Data analysis

Descriptive statistics were used to summarise the sample characteristics, and the proportions of fathers reporting psychological distress (K6), physical health problems (specific health problems and overall physical health) and health behaviours (alcohol use, cigarette smoking, BMI). X^2 Tests and t-tests were computed to assess for significant differences in sociodemographic characteristics between

the father groups. A series of one-way between-subjects analysis of variance (ANOVA) were conducted to assess for differences in psychological distress between the father groups on the K6 continuous variable, with and without adjusting for SEP. We also conducted further analyses adjusting for SEIFA Index of Relative Socio-economic Disadvantage. Given that the results were similar, we only present the results when adjusting for SEP. Multinomial logistic regression analyses were conducted for the K6 cut points and the categorical physical health variables, with and without adjustment for SEP. In all models, Australian-born fathers was the reference category.

Missing data for all study variables were handled using multiple imputation. Twenty complete datasets were imputed using a multivariate normal model incorporating all variables in the analyses. The descriptive, ANOVA and logistic regression analyses were conducted using complete cases as well as with the total sample using multiply imputed data. Given that the analyses yielded similar results, only those using imputed data are presented here. For these analyses, we obtained pooled estimates for all proportions and model parameter estimates. All analyses were conducted using SPSS V.21.0.

RESULTS

Sample characteristics

There was a total of 9369 children and their families participating in both cohorts when they were 4–5 years of age. Of these, 86.9% (n=8137) had a biological, adoptive, foster or step-father in the home. There were 131 (1.6%) fathers of likely refugee background, 872 (10.7%) who had migrated from a predominantly non-English-speaking country, 1005 (12.4%) who had migrated from an English-speaking country and 6129 (75.3%) born in Australia. Table 1 presents the demographic characteristics for each group. The majority of fathers in all groups were biological in a two-parent household. Approximately, 70% of fathers of refugee background came from the Middle East and Southeast Asia, while the majority of fathers of non-English-speaking background came from Southern and Central Asia, Southeast Asia, Southern and East Africa, and the Middle East. The vast majority of fathers who migrated from an English-speaking country came from Great Britain or New Zealand. The average time since arrival was longest for fathers who migrated from an English-speaking country (21.1 years), and this was significantly longer than for fathers of refugee background (15.9 years) or those who had migrated from a non-English speaking country (17.3 years).

There were significant differences between the groups of fathers with respect to education, employment and socioeconomic status. The proportion of fathers who did not complete high school was significantly higher among fathers of refugee background and fathers born in Australia than fathers from English-speaking and non-English-speaking countries. The number of fathers from non-English-speaking and English-speaking countries

Table 1 Sample characteristics for fathers of likely refugee backgrounds, fathers who had migrated from non-English-speaking and English-speaking countries, and fathers born in Australia

Demographic characteristics	Refugee (n=131)	Migrated from a non-English-speaking country (n=872)	Migrated from an English-speaking country (n=1005)	Born in Australia (n=6129)	F or χ^2	P
Caregiver type, n (%)						
Biological father	131 (100.0%)	865 (99.2%)	980 (97.5%)	5967 (97.4%)		
Adoptive father	0 (0.0%)	0 (0.0%)	1 (0.1%)	12 (0.2%)	16.0	0.192
Step-father	0 (0.0%)	7 (0.8%)	24 (2.4%)	147 (2.4%)		
Foster father	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (<0.1%)		
Age (mean)	39.3	39.6	39.4	37.2	76.4	<0.001
Country/region of birth, n (%)						
New Zealand	0 (0.0%)	0 (0.0%)	246 (24.5%)			
Great Britain	0 (0.0%)	0 (0.0%)	553 (55.0%)			
North America	0 (0.0%)	0 (0.0%)	52 (5.2%)			
Melanesia	0 (0.0%)	0 (0.0%)	19 (1.9%)			
Polynesia	0 (0.0%)	56 (6.4%)	11 (1.1%)			
Western Europe	0 (0.0%)	62 (7.1%)	0 (0.0%)			
Southern Europe	0 (0.0%)	34 (3.9%)	0 (0.0%)			
South Eastern Europe	7 (5.3%)	36 (4.1%)	0 (0.0%)			
Eastern Europe	1 (0.8%)	20 (2.3%)	0 (0.0%)			
North Africa	8 (6.1%0	17 (1.9%)	0 (0.0%)			
Middle East	46 (35.4%)	84 (9.6%)	0 (0.0%)			
Southeast Asia	50 (38.2%)	131 (15.0%)	0 (0.0%)			
Northeast Asia	0 (0.0%)	94 (10.8%)	0 (0.0%)			
Southern and Central Asia	6 (4.6%)	153 (17.5%)	0 (0.0%)			
South America	5 (3.8%)	10 (1.1%)	0 (0.0%)			
Central America	4 (3.1%)	1 (0.1%)	0 (0.0%)			
Southern and East Africa	4 (3.1%)	90 (10.3%)	0 (0.0%)			
Confidentialised	0 (0.0%)	87 (9.9%)	124 (12.3%)			
Time since arrival in years (mean)	15.9	17.3	21.1		31.2	<0.001
English main language spoken at home	3 (2.3%)	228 (26.1%)	925 (92.0%)	5854 (95.5%)	3882.8	<0.001
Speaks English						
Very well	45 (34.4%)	450 (51.6%)	87 (8.6%)	319 (5.2%)		
Well	50 (38.2%)	195 (22.4%)	25 (2.5%)	20 (0.3%)		
Not well	30 (22.9%)	62 (7.0%)	4 (0.4%)	3 (0.1%)	192.9	<0.001
Not at all	2 (1.5%)	11 (1.3%)	1 (0.1%)	0 (0%)		
Not reported/not relevant	4 (3.0%)	154 (17.7%)	888 (88.4%)	5787 (94.4%)		
High school completion						
Did not complete high school	55 (42.0%)	230 (26.4%)	397 (39.5%)	2884 (47.1%)	139.5	<0.001
Completed high school	76 (58.0%)	642 (73.6%)	608 (60.5%)	3245 (52.9%)		
Tertiary education						
No tertiary education	97 (74.0%)	490 (56.2%)	653 (65.0%)	4451 (72.6%)	111.31	<0.001
Completed tertiary education	34 (26.0%)	382 (43.8%)	352 (35.0%)	1678 (27.4%)		

Table 1 Continued

Demographic characteristics	Refugee (n=131)	Migrated from a non-English-speaking country (n=872)	Migrated from an English-speaking country (n=1005)	Born in Australia (n=6129)	F or χ^2	P
Employment status						
Not in the labour force	19 (14.5%)	44 (5.0%)	41 (4.1%)	225 (3.7%)		
Unemployed and looking for work	7 (5.3%)	26 (3.0%)	16 (1.6%)	87 (1.4%)	143.6	<0.001
Part-time employment	20 (15.3%)	72 (8.3%)	38 (3.8%)	233 (3.8%)		
Full-time employment (30+hours/week)	85 (64.9%)	730 (83.7%)	910 (90.5%)	5580 (91.0%)		
Weekly income ($A/week)						
Less than 500	51 (49.0%)	171 (23.4%)	112 (12.4%)	726 (11.8%)		
500–999	32 (30.8%)	238 (32.5%)	257 (28.5%)	1828 (29.8%)		
1000–1999	18 (17.3%)	250 (34.2%)	368 (40.8%)	2320 (37.9%)	197.6	<0.001
2000 or more	3 (2.9%)	73 (9.9%)	165 (18.3%)	700 (11.4%)		
Not reported	27	140	103	555 (9.1%)		
Study child gender, male	57 (43.5%)	438 (50.2%)	515 (51.2%)	3145 (51.3%)	3.5	0.322
Number of children in household (mean)	3.1	2.5	2.5	2.5	15.0	<0.001
Two-parent household	131 (100.0%)	868 (99.5%)	995 (99.0%)	6089 (99.3%)	4.7	0.581
Socioeconomic position (M, SD)	–0.64	0.22	0.24	0.10	36.9	<0.001
Socioeconomic position category						
High	18 (13.7%)	276 (31.7%)	293 (29.2%)	1447 (23.6%)		
Medium	38 (29.0%)	378 (43.3%)	511 (50.8%)	3149 (51.4%)	120.2	<0.001
Low	75 (57.3%)	218 (25.0%)	201 (20.0%)	1533 (25.0%)		
SEIFA disadvantage (M, SD)	977.7	1018.2	1025.5	1013.9	28.8	<0.001

SEIFA, socio-economic indexes for areas.

who had completed tertiary education was higher than fathers of refugee background and fathers born in Australia. The proportion of fathers working part-time or currently unemployed was higher for fathers of refugee background and fathers from non-English-speaking countries than the other groups. Full-time employment was lower for fathers of refugee background compared with all other groups. The proportion of fathers with an average weekly income of less than $500 was significantly higher among fathers of refugee background, and the proportion earning higher than $1000 was lowest for this group. The proportion of fathers to have low SEP was highest among fathers of refugee background, and their SEIFA scores were significantly lower compared with the other groups. Migrant fathers (both English speaking and non-English speaking) were more likely to have high SEP compared with Australian born fathers. SEIFA scores were significantly lower for Australian-born fathers compared with both migrant father groups, and there were no significant differences between the two migrant father groups. Finally, fathers from refugee backgrounds

were more likely to have larger number of children compared with all other father groups.

Psychological distress

The extent of missing data across all study variables including the K6 was approximately 17.6%, and approximately 20% of cases had missing data. Twenty complete datasets were imputed to ensure that the number of imputations was as least as large as the percentage of missing data.[44] Table 2 presents the proportion of fathers reporting psychological distress in the normal range or the symptomatic and clinical cut points. With respect to continuous scores on the K6, a one-way between-subjects ANOVA revealed significant differences in psychological distress across the groups with and without adjusting for SEP (unadjusted for SEP: $F_{(3, 8132)}=34.29$, P<0.001, $\eta^2=0.012$; adjusted for SEP; $F_{(3, 8132)}=28.38$, P<0.001; $\eta^2=0.01$). Tukey's post hoc tests revealed that fathers of refugee background reported significantly higher psychological distress than Australian-born fathers and fathers from English-speaking countries. Fathers migrating from

Table 2 Descriptive statistics (unadjusted) for psychological distress measured by the Kessler-6 for each father group when their children were aged 4–5 years

Outcomes	Refugee (n=131)	Migrated from a non-English-speaking country (n=872)	Migrated from an English-speaking country (n=1005)	Born in Australia (n=6129)
Psychological distress (continuous score), mean	9.03	6.4	5.5	5.2
Psychological distress (cut points)				
Normal range (<7), n (%)	57 (43.5%)	554 (63.5%)	739 (73.5%)	4590 (74.9%)
Symptomatic or clinical cut point (8+), n (%)	74 (56.5%)	318 (36.5%)	266 (26.5%)	1539 (25.1%)

a non-English-speaking country reported significantly higher distress than Australian-born fathers.

Table 2 indicates that the proportion of fathers reporting psychological stress at the symptomatic or clinical cut points on the K6 was highest for fathers of refugee background, followed by fathers from a non-English-speaking country. Table 3 indicates that without adjustment for SEP, refugee fathers had the highest odds of reporting psychological distress in the symptomatic or clinical ranges compared with fathers born in Australia. Fathers from non-English-speaking countries also had increased odds of reporting distress in the symptomatic or clinical range compared with Australian-born fathers. There were no significant differences between fathers from English-speaking countries and Australian-born fathers. These associations remained significant even when adjusting for SEP.

General health and health behaviours

Table 4 presents the proportion of fathers in each group reporting physical health conditions, global health problems, alcohol use, cigarette smoking and weight problems. The pattern of results for the multinomial logistic regression analyses with and without adjusting for SEP

were similar; therefore, the adjusted results are presented in table 5 . Refugee fathers had the highest odds of fair to poor overall global health compared with fathers born in Australia. Refugee fathers and those from non-English-speaking countries had lower odds of moderate to harmful alcohol use than Australian-born fathers. Refugee fathers and those from non-English-speaking countries had higher odds of being underweight compared with Australian-born fathers. Fathers from English-speaking and non-English-speaking countries had lower odds of being overweight or obese than Australian-born fathers.

DISCUSSION

In a population-based study of over 8000 Australian families, we identified 131 fathers of likely refugee background who arrived in Australia between 1951 and 2007 from countries such as Afghanistan, Iraq, Vietnam and Cambodia. Ten percent were migrant fathers from predominantly non-English-speaking countries, and a further 12% were migrant fathers from English-speaking countries. These proportions are somewhat under-representative of migrant families in the general Australian

Table 3 Multinomial logistic regression results examining differences in psychological distress at the Kessler-6 clinical cut point between the father groups adjusted and unadjusted for socioeconomic position when their children were aged 4–5 years

Outcomes	Refugee*	Migrated from a non-English-speaking country*	Migrated from an English-speaking country*
Unadjusted for SEP			
Mental health (K6)			
Normal range (<7)	Ref	Ref	Ref
Symptomatic or clinical cut point (8+)	**3.93 (2.66 to 5.81), <0.001**	**1.71 (1.44 to 2.03), <0.001**	1.07 (0.91 to 1.27), 0.403
Adjusted for SEP			
Mental health (K6)			
Normal range (<7)	Ref	Ref	Ref
Symptomatic or clinical cut point (8+)	**3.17 (2.13 to 4.74), <0.001**	**1.79 (1.51 to 2.13), <0.001**	1.13 (0.95 to 1.33), 0.169

Bold text indicates significance at P<0.05.
*'Fathers born in Australia' is the reference category.
K6, Kessler-6; SEP, socioeconomic position.

Table 4 Descriptive statistics for physical health conditions for each father group when their children were aged 4–5 years

Outcomes	Refugee (n=131)	Migrated from a non-English-speaking country (n=872)	Migrated from an English-speaking country (n=1005)	Born in Australia (n=6129)
Physical health issues				
None	121 (92.4%)	800 (91.7%)	913 (90.8%)	5528 (90.2%)
One or more	10 (7.6%)	72 (8.3%)	92 (9.2%)	601 (9.8%)
Global health				
Very good to excellent	54 (41.2%)	452 (51.8%)	539 (53.6%)	3279 (53.5%)
Good	45 (34.4%)	301 (34.5%)	338 (33.6%)	2089 (34.1%)
Fair to poor	32 (24.4%)	120 (13.8%)	128 (12.7%)	761 (12.4%)
Alcohol use				
Abstain to occasional	84 (64.1%)	426 (48.9%)	206 (20.5%)	1277 (20.8%)
Light (<2 drinks/day)	44 (33.6%)	380 (43.6%)	573 (57.0%)	3463 (56.5%)
Moderate to harmful (>3 drinks/day to >6 drinks/day)	3 (2.3%)	66 (7.6%)	226 (22.5%)	1389 (22.7%)
Cigarette smoking				
Do not smoke at all/less than once per day	78 (59.5%)	674 (77.3%)	814 (81.0%)	4786 (78.1%)
At least once a day	53 (40.5%)	198 (22.7%)	191 (19.0%)	1343 (21.9%)
BMI status				
Underweight	18 (13.7%)	60 (6.9%)	42 (4.2%)	147 (2.4%)
Normal weight	41 (31.3%)	333 (38.2%)	313 (31.1%)	1675 (27.3%)
Overweight	47 (35.9%)	376 (43.1%)	478 (47.6%)	3074 (50.2%)
Obese	25 (19.1%)	103 (11.8%)	172 (17.1%)	1233 (20.1%)

population. Australian Census data indicate that a quarter (24.6%) of the Australian population was born overseas, and 43% had at least one overseas-born parent.[45]

Approximately half the fathers of likely refugee background reported high levels of psychological distress at the symptomatic and/or clinical cut points on the K6, compared with approximately a third of fathers from non-English-speaking backgrounds and approximately one quarter of those from English-speaking countries and Australian-born fathers. Fathers of likely refugee background were three to four times more likely to report psychological distress in the symptomatic and/or clinical cut points compared with Australian-born fathers. The odds were only marginally attenuated after adjusting for SEP. These findings are in line with studies reporting high rates of mental health problems for refugees[7 23 25] and higher than the two studies reporting on post-traumatic stress symptoms of refugee fathers.[8 27] We also found that fathers migrating to Australia from non-English-speaking countries were at elevated risk of psychological distress, with an almost twofold increase in odds of psychological distress in the symptomatic and/or clinical range compared with Australian-born fathers. We did not find any significant differences in psychological distress between fathers from English speaking countries and Australian-born fathers. Given that people fleeing their country to seek safety have experienced traumatic and

often life-threatening events,[3–6] it is not surprising that fathers of refugee background reported the highest rates of psychological distress.

Refugee fathers were also more likely to rate their general health as fair to poor and were more likely to be underweight than Australian-born fathers. Fathers from non-English-speaking countries were also more likely to be underweight than Australian-born fathers. There were no significant findings for physical health conditions such as chronic pain, sight or hearing problems, or difficulty breathing. This was somewhat surprising given that some studies of refugee men more broadly have reported that they are at increased risk for musculoskeletal, respiratory, cardiovascular and infectious diseases.[4 24 26] We interpret these findings with caution because, prior to 2011, refugees with disabilities were excluded from Australia's humanitarian programme, and it is possible that some fathers of refugee background were reluctant to disclose chronic health issues or disabilities. Further research into the physical health of refugee fathers is critical given that many have experienced torture and trauma and difficult prearrival experiences.

It is also important to note that refugee and migrant fathers had some protective health behaviours. For instance, refugee fathers and those from non-English-speaking countries had lower odds of light to harmful alcohol use than Australian-born fathers.

Table 5 Multinomial logistic regression results examining differences in physical health conditions between the father groups adjusted for socioeconomic position when their children were aged 4–5 years

Outcomes	Refugee*	Migrated from a non-English-speaking country*	Migrated from an English-speaking country*
Physical health conditions			
None	Ref	Ref	Ref
One or more	0.59 (0.31 to 1.14), 0.119	0.85 (0.74 to 0.97), 0.209	0.97 (0.86 to 1.09), 0.804
Global health			
Very good to excellent	Ref	Ref	Ref
Good	1.17 (0.71 to 1.91), 0.540	1.07 (0.86 to 1.32), 0.557	1.01 (0.85 to 1.20), 0.939
Fair to poor	**1.95 (1.06 to 3.60), 0.033**	1.18 (0.88 to 1.58), 0.264	1.07 (0.80 to 1.43), 0.639
Alcohol use			
Abstain to occasional	Ref	Ref	Ref
Light (<2 drinks/day)	**0.25 (0.15 to 0.43), <0.001**	**0.30 (0.24 to 0.37), <0.001**	0.97 (0.80 to 1.17), 0.724
Moderate to harmful (>3 drinks/day to >6 drinks/day)	**0.04 (0.10 to 0.17), <0.001**	**0.14 (0.10 to 0.19), <0.001**	0.98 (0.79 to 1.22), 0.880
Cigarette smoking			
Do not smoke at all/less than once day	Ref	Ref	Ref
At least once a day	1.39 (0.84 to 2.30), 0.201	1.11 (0.88 to 1.41), 0.382	0.92 (0.75 to 1.14), 0.455
Weight status			
Normal weight	Ref	Ref	Ref
Underweight	**3.49 (1.57 to 7.74), 0.003**	**2.10 (1.31 to 3.35), 0.003**	1.59 (0.92 to 2.74), 0.095
Overweight	0.60 (0.33 to 1.10), 0.101	**0.62 (0.51 to 0.75), <0.001**	**0.84 (0.68 to 1.03), 0.087**
Obese	0.69 (0.35 to 1.36), 0.277	**0.43 (0.32 to 0.58), <0.001**	**0.77 (0.61 to 0.98), 0.030**

Bold text indicates significance at P<0.05.
*'Fathers born in Australia' is the reference category.

Furthermore, fathers from English-speaking countries and non-English-speaking countries had lower odds of being overweight or obese than Australian-born fathers.

Overall, the findings indicate that fathers of refugee background are more likely than Australian-born fathers to experience a range of psychological and general health issues. Migrant fathers of non-English-speaking background also appear to experience greater psychological morbidity than Australian-born fathers. While migration is likely to be a time of adjustment for all fathers born overseas, those of refugee and non-English-speaking background are more likely to experience significant stressors associated with language barriers, cultural differences and access to services that may impact on their health and well-being. Many migrants from English-speaking countries come to Australia on a 'skilled visa' with recognised qualifications and are less likely to experience difficulties finding employment and adequate income.[46] This is also the case for migrants of non-English-speaking background who come to study and then remain in Australia. In contrast, fathers of refugee background may have a history of torture and other traumatic events, disrupted or limited access to education and therefore be more likely to experience prolonged periods of social and economic disadvantage after settlement. Low employment rates and low household income were observed for these fathers in our study. Understanding how these factors impact on fathers' health, well-being and family relationships is important, along with a better understanding of what factors may facilitate positive outcomes in the longer term.

Strengths and limitations

To our knowledge, this is the first population-based child cohort study in a high-income country to identify and report mental and physical health outcomes for fathers of likely refugee background. The design of the study and size of the sample enabled us to compare mental and physical health outcomes and health behaviours in fathers of refugee background with Australian-born fathers and migrant fathers of non-English-speaking and English-speaking backgrounds. In the context of increasing global economic and forced migration, it is important for public health methods to evolve in ways that permit meaningful description of population health trends. Although no information pertaining to parental or children's visa status was collected in the LSAC, by combining data on fathers' country of birth and year of arrival in Australia, we were able to identify fathers

of likely refugee background. This method is increasingly being used as the best proxy measure of likely refugee background.[36 38] While using this approach may have led to some misclassification of fathers of refugee background in our sample, it constitutes a reasonable approximation. Furthermore, collecting information about visa status can be problematic due to sensitivities regarding disclosure and changing status over time. Hence, even when data regarding visa status are available, this information may not represent a gold standard measure.

Similar issues are apparent for identifying fathers from non-English-speaking countries. While participants were asked to report on their main language spoken at home, there was no provision made for other languages spoken at home. Accurately obtaining a picture of language spoken at home and in different contexts (ie, between parents, between parents and children, in the community, at work) is an important but complex methodological issue. We opted to use the official language(s) of the country in which the fathers were born to distinguish between fathers from English-speaking or non-English-speaking countries. This may have led to some fathers being misclassified.

Another limitation is that families of non-English-speaking backgrounds were under-represented in LSAC and were more likely to be lost to follow-up. The sample is likely to be representative of more socially and economically advantaged families with higher levels of English proficiency. This is likely to have resulted in the prevalence estimates of mental and physical health underestimating the true prevalence of poor health outcomes. Furthermore, non-English-speaking families may have declined to participate due to lack of understanding about the study and what the information would be used for. Researchers have noted that people unaccustomed to research may be fearful, concerned and worried about the information collected, who will have access to it and how it will be used.[47–49] Possible solutions require working in partnership with relevant community agencies to maximise inclusion of harder to reach groups and ensuring that appropriate steps are taken to address language barriers to participation, such as the use of professional interpreters and bicultural workers. Community input through consultation and engagement can inform the development of study protocols and measures to ensure cultural appropriateness and face validity. Establishing such strategies may support retention of the cohort over time.

Another limitation is that the LSAC necessarily employed brief measures. Although the K6 is a widely used and psychometrically sound instrument, there has been limited assessment of its appropriateness for different cultural groups.[50] Using family members to interpret may have led to under-reporting of mental and physical health problems by fathers reluctant to disclose health issues to family members. Furthermore, no information about experiences, health or well-being prior to arrival in Australia was collected for fathers born overseas. The conclusions drawn from this study must be considered within the context of these limitations.

Implications and conclusions

Internationally, it is estimated that 5%–10% of fathers experience mental health difficulties in the early years of their children's lives.[18 21 51 52] Our findings suggest that fathers of refugee background and those who have migrated from countries with different main languages to the destination country might be particularly vulnerable to poor paternal health. These are important findings given the small but growing body of evidence demonstrating links between fathers' mental health and their children's health, well-being and development.[53 54]

Building on the analyses presented in this paper, we have an opportunity to examine fathers' mental health over time and to assess longitudinally the relationship between the mental and physical health of refugee and migrant fathers and their children's health and well-being. However, we are also mindful that the picture that can be obtained from longitudinal studies needs to be supplemented by qualitative research using culturally appropriate and sensitive methods to gain in depth understanding of fathers' experiences and support needs and the longer term impacts of economic and forced migration on family functioning and well-being.

We recommend that future longitudinal studies take steps to increase the involvement of refugee and migrant families and include fathers wherever possible and appropriate. To ensure adequate representation, greater attention to methods tailored to engage and identify migrant and refugee families is essential. Overcoming barriers that limit engagement and identification of 'harder to reach' populations is critical if population studies are to be a useful vehicle for informing and tailoring services to meet the needs of increasingly diverse populations in high-income countries.

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