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Building a new life in Australia: an analysis of the first wave of the longitudinal study of humanitarian migrants in Australia to assess the association between social integration and self-rated health

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ABSTRACT

Objectives: To assess the relationship between social integration and physical and mental health among humanitarian migrants (HMs) in Australia.

Design, setting and participants: We used the recently released first wave of data from the 2013 'Building a New Life in Australia' survey, which is an ongoing nationwide longitudinal study. A total of 2399 HMs participated in the survey.

Main outcome measures: Self-rated physical health was measured using four items selected from the SF-36 which is a generic measure of health status. The 6-item Kessler Screening Scale for Psychological Distress (K6) was used to measure mental health. Social integration was measured using four dimensions: economic integration, acculturation, social capital and self-identity.

Results: More than half (63%), 47% and 49% of participants self-rated well on the general health, physical function and role-physical dimensions, respectively and 46% reported not having any bodily pain. Seventeen per cent of participants had a serious mental illness. There was a positive relationship between social integration and physical and mental health. That is, factors associated with better health included less financial hardship (economic integration dimension), better English proficiency and self-sufficiency (acculturation dimension), having the capacity to communicate with locals, having friends from different ethnic/religious groups and attending a place of worship weekly or more often (social capital dimension) and feeling welcomed and having a strong sense of belonging in Australia (self-identity dimension).

Conclusions: Using a more comprehensive framework of social integration, we found that greater social integration was associated with better physical and mental health outcomes among HMs. Social integration should be embedded in HMs' resettlement programmes in order to reduce migration-related health inequities.

Strengths and limitations of this study

- This is the first study to assess the relationship between social integration and physical and mental health among humanitarian migrants from low and middle-income countries resettling in an industrialised country.
- It was found that greater social integration was associated with better physical and mental health of humanitarian migrants. Embedding social integration activities into resettlement programmes for humanitarian migrants would be the first step to reducing migration-related inequities in physical and mental health.
- The outcome measures in this study are based on self-reported responses, and may be influenced by numerous factors including personal interpretations and nuances across languages and cultures, with unavoidable recall bias.
- All analyses are correlational and no causality can be implied.

INTRODUCTION

The protection and resettlement of refugees and others in refugee-like situations have been the preoccupation of the international community since the end of the World War II. By the end of 2015, there were ~24.5 million refugees and asylum seekers who were forcibly displaced worldwide.[1] To provide protection, the United Nations High Commissioner for Refugees (UNHCR) leads a resettlement programme.[2] Australia, by annually granting about 14 000 visas under its Refugee and Humanitarian Programme since 1977, is one of the main countries for refugee resettlement in the world.[1 3] The Australia's Refugee and Humanitarian Programme comprises three major categories

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of permanent visas: refugee, the Special Humanitarian Programme (SHP) and onshore protection visas.[3] Applicants of refugee category are mainly identified and referred by UNHCR to Australia for resettlement. The SHP visa category is for people who are subject to substantial discrimination amounting to gross violation of their human rights in their home country, and who are proposed for entry by an eligible sponsor in Australia or New Zealand. The onshore stream covers people already in Australia who are found to be refugees according to the 1951 Refugee Convention.[4] Humanitarian migrants (HMs) do not include economic migrants.

Previous research on migration and health was mainly conducted among international migrants from low and middle-income countries (LMICs) to industrialised countries. Findings from these studies have postulated the 'healthy migrant effect/paradox', which hypothesises that recent migrants from LMICs tend to have better health than permanent residents in host countries and those remaining behind in sending countries.[5–11] However, HMs experience forced displacement and other traumatic events before resettlement. The healthy migrant effect might not apply to them given their impaired premigration health and health environment. In addition, on arrival in the host country, HMs commonly face social and cultural disadvantages and challenges.[12] For example, previous research has shown that HMs are vulnerable to suboptimal mental and physical health, compared with either residents or other migrants in resettlement countries.[12 13] Consequently, the WHO has called for closing the health inequities gap between different groups by dealing with social determinants.[14] Social integration has been defined by the United Nations as the capacity of people to participate in social, cultural, economic and political life in the community.[15] Therefore, improving social integration may contribute to the reduction of migration-related health inequities through improving health of the most vulnerable migrants. However, there is very little understanding of the relationship between social integration and health among HMs.

Results from existing studies among migrants without a refugee background have been mixed. One aspect of social integration is the level of acculturation, which conceptualises migrants according to their cultural orientation or identification with traditional and host cultures with four possible outcomes: separation or traditional (ie, migrants maintain loyalty to traditional culture while resisting the host culture); assimilation (ie, migrants reject the traditional culture and fully embrace the host culture); integration or bicultural (ie, migrants retain the cultural identity of the home and host culture) and marginalisation (ie, migrants reject cultural dimensions of the home and host culture).[16] In a meta-analyses examining the relationship between acculturation and depression, Gupta and colleagues[17] found a small but statistically significant negative relationship between degree of assimilation and depression. This pattern was also true for separation, but the relationship was no statistically significant. They concluded that migrants' orientation toward any culture has a positive health outcome. However, enculturation was positively related to anxiety.[17 18] Inconsistent findings for the relationship between assimilation and physical health have also been reported in previous studies.[19–21] These mixed results may be due to many factors, but the main one is the differences in the conceptualisation and measurement of social integration across studies.[17 19–22] According to the UN's definition,[15] social integration is a multidimensional concept and involves gradual processes. However, a comprehensive measure of what constitutes social integration has not been applied and most of the research described above has used the level of acculturation as a surrogate measure of social integration. In doing so, the studies used different measures of acculturation, hence making it difficult to compare findings across studies and settings. In addition, the concept of acculturation does not necessary encompass social, economic and political aspects of integration.[17 19–22]

Therefore, we adopted a recent theoretical framework developed by Yang,[23] which measured social integration with four dimensions, namely economic integration, acculturation, social capital and self-identity. The aim of the study was to investigate the associations between social integration and physical and mental health among HMs in Australia. More specifically, we wished to explore which dimensions of social integration would be associated with HMs' health after controlling for possible socio-demographic and migration-related factors, and exposure to traumas as they are all associated with migrants' health in previous studies.[17 19–22 24]

METHODS

Data resource

The study used data from the first wave of the 'Building a New Life in Australia (BNLA)' study. The study focused on HMs and was conducted by the Australian Institute of Family Studies. The BNLA project is a longitudinal study following a large cohort of recently arrived HMs as they settle into life Australia (2013–2018). Data used in this study were collected from October 2013 to March 2014 via home visits.[25]

Participants

The study population included 'migrating units' (MUs) who had been granted permanent humanitarian visa in the 3–6 months preceding the survey. The MU could consist of a single individual (principal applicant) or members of a family (principal applicant and secondary applicants) who were named on the same visa application. Given the high mobility among recently arrived migrants, a complex sampling scheme was used. First, a total of 11 study sites were selected based largely on where HMs were expected to be settling during the field study. The information on geographic areas in which

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humanitarian arrivals were living between November 2010 and October 2011 was used to identify study sites. Second, within each study site, principal applicants aged 18 years or older were identified as the potential eligible persons (n=4035). Contact details of eligible principal applicants in the 11 sites were provided by the Australian Government's Department of Immigration and Border Protection and supplied to field work interviewers. Owing to high mobility of HMs and incomplete contact details (eg, without mobile phone number), a total of 2031 out of 4035 eligible principal applicants were successfully contacted. Of principal applicants successfully contacted, 1509 were willing to participate in the study. Secondary applicants aged 15 years or older were invited to voluntarily participate if their respective principal applicant was participating in the study.[25]

Ethics

The BNLA data are publicly available to authorised researchers who have obtained permission from the Australian Department of Social Services. Therefore, the BNLA data set made available to researchers does not contain variables on study participants' personal identifiers due to ethical issues. AR and WC obtained the permission to use the data set.

Measurement

In the first wave of the BNLA study, the questionnaire was administered via a computer-assisted self-interview (CASI) or via computer-assisted personal interview (CAPI) with a bilingual interviewer or interpreter. To accommodate the diverse cultural and linguistic backgrounds of participants, the survey was offered in English and other 18 languages (namely Amharic, Arabic, Burmese/Mynmar, Chin/Haka, Dari, Hazaragi, Karen, Nepali, Oromo, Pashto, Persian, Somali, Swahili, Tamil, Tigrinya and three other confidentialised languages).[25]

Dependent variables

The study's dependent variables were HMs' physical and mental health.

Physical health during the past 4 weeks preceding the survey was measured by four items selected from four subscales of SF-36 health status questionnaire: general health, physical function, role-physical and bodily pain. The SF-36 is a generic measure of health status with high reliability and validity.[26] The four questions used to measure physical health were:

- *General health*: Overall, how would you rate your health during the past 4 weeks?
- *Physical function*: During the past 4 weeks, how much did physical health problems limit your usual physical activities (such as walking or climbing stairs)?
- *Role-physical*: During the past 4 weeks, how much difficulty did you have doing your daily work, at home and away from home, because of your physical health?
- *Bodily pain*: How much bodily pain have you had during the past 4 weeks?

Questions used to measure self-rated physical health and their rating scales are summarised in online supplementary appendix Table S1.

Mental health during the past 4 weeks preceding the survey was measured by the 6-item Kessler Screening Scale for Psychological Distress (K6). The K6 has been translated into multiple languages, and used cross culturally for measuring non-specific psychological distress.[27] The Australian K6 consists of six questions scored on a 5-point scale, with total scores ranging from 6 to 30. Respondents with scores of 19 and above are classified as having a probable serious mental illness.[28] In this study, internal consistency reliability of K6 was 0.93.

Independent variable

The independent variable was the social integration, which encompassed four dimensions.[23] These were economic integration, acculturation, social capital and self-identity. Questions for all social integration dimensions and their rating scales are summarised in online supplementary table S1.

Dimension 1-economic integration included four indicators relating to employment status, main source of income, current housing arrangement and numbers of financial hardship in the daily life (0–6). We used main source of income instead of the actual income as an indicator because 94% of study participants were unemployed. In terms of financial hardships, data were obtained on participants' inability to pay for daily necessities and needing financial help due to lack of money.

Dimension 2-acculturation consisted of three dimensions: (1) improvements in English language proficiency, defined as the difference of language proficiency between before and after migration. Language proficiency (4 as the worst to 16 as the best) before and after migration included understanding spoken English and English speaking, writing and reading proficiency; (2) self-sufficiency to participate in the life in Australia (7 as the poorest to 28 as the best), which included seven items relating to social, cultural, economic and political life in Australia and (3) participation of study or job training in Australia. Reliability analyses found strong internal consistency for language acculturation (α=0.96) and self-sufficiency (α=0.91).

Dimension 3-social capital consisted of four dimensions. Capacity to communicate with locals (3 as lowest to 12 as highest) included three items relating to make friend, understand the culture and talk to neighbours in Australia. Community support (3 as no support to 9 as strong support) measured support in Australia from different community groups. Frequency of attending place of worship, and type of friends in Australia were also measured. Reliability analyses found strong internal consistency for capacity to communicate (α=0.82), and community support (α=0.84).

Dimension 4-self-identity was measured by three indicators relating to feeling part of the Australian community,

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and feeling welcomed and experiencing discrimination in Australia.

Covariates

Covariates included self-reported age, sex, education level, marital status, country of origin, visa subclass, duration of residence in Australia (<6 months, 6–12 months and >1 year) and experience of traumas before arriving in Australia (yes or no). Country of origin was derived from country of birth on participants' visa application. In total, 35 countries were coded according to the 2011 Standard Australian Classification of Countries (major groups: North Africa and the Middle East, South-East Asia, Southern and Central Asia, Sub-Saharan Africa and other countries).[29] In terms of visa subclass, the Australia's Refugee and Humanitarian Programme comprises three major categories of permanent visas: refugee, SHP and onshore protection visas (refugee, SHP and onshore pathway).[3]

Statistical analysis

Descriptive statistics including the mean, SD, frequency and proportion were used to summarise the characteristics, social integration and health of study participants.

The association between social integration and general health, physical function, role-physical and bodily pain were estimated by ordered logistic regressions. To ensure there were observations with each set of social integration indicators, general health, physical function and role-physical were recoded into three categories (1= poor, 2= fair, 3= good) and bodily pain was recoded into four categories (1= severe, 2= moderate, 3= mild, 4= none) by combining adjacent small categories. Binary logistic regression was used to assess the association between social integration and mental health. Analyses were conducted using IBM SPSS Statistics V.21.0 (IBM Corp. Armonk, New York, USA).

RESULTS

Characteristics of study participants

Out of 4035 eligible principal applicants, 2031 (50%) were successfully contacted, of whom 2399 HMs (1509 principal applicants and 890 secondary applicants) took part in the study. The mean age was 35.5 years (SD=13.9). In total, 54% of the participants were male, and 57% were married or cohabitating. More than half (56%) of the participants came from North Africa and the Middle East, 80% arrived in Australia under the refugee visa pathway and 76% had lived in Australia for <6 months. The majority of participants (91%) have been exposed to traumas before coming to Australia (table 1).

Self-rated physical and mental health

During the last 4 weeks preceding the survey, 63% (n=1517), 47% (n=1132) and 49% (n=1184) of participants self-rated good on the general health, physical function and role-physical, respectively. Approximately half of the participants (46%, n=1094) reported having no bodily pain while 17% (n=394) probably had a serious mental illness (according to their K6 score) during the 4 weeks preceding the survey (figure 1).

Social integration

The majority (94%) of participants were unemployed, and 43% had at least one financial hardship in Australia (table 2). The average score for the prepost migration language proficiency difference, self-sufficiency, capacity to communicate and community support was 1.1 (SD=1.9), 15.1 (SD=5.9), 6.6 (SD=2.2) and 5.0 (SD=2.2), respectively. In total, 15% of HMs had participated in study or job trainings in Australia. In total, 53% of study participants did not or rarely attended a place of worship, while 47% had friends, mainly from their own ethnic/religious community. The proportion of participants reporting always feeling part of the Australian community and welcomed in Australia was 47% and 54%, respectively.

Association between social integration and self-rated health

The regression results showed significant associations between social integration and health after controlling for confounding factors (table 3). Poor physical health was associated with having a high number of financial hardships and not feeling welcomed in Australia. Self-sufficiency was positively associated with all aspects of physical health. In addition, participants reporting improvements in English language proficiency had better general health (aOR=1.1, 95% CI 1.0 to 1.2), better role-physical (aOR=1.0, 95% CI 1.0 to 1.1) and less bodily pain (aOR=1.0, 95% CI 1.0 to 1.1) than those who showed no improvements. Compared with participants who lacked the capacity to communicate with locals, those who communicated effectively with locals had better general health (aOR=1.0, 95% CI 1.0 to 1.1), physical functioning (aOR=1.1, 95% CI 1.0 to 1.1) and role-physical (aOR=1.1, 95% CI 1.0 to 1.2).

Compared with people without financial hardships, the odds of serious mental illness increased from 1.5 (95% CI 1.0 to 2.3), 2.5 (95% CI 1.7 to 3.8) to 4.2 (95% CI 2.9 to 6.7) if the individual experienced one, two and three or more hardships, respectively. Compared with people reporting to always feeling part of the Australian community, the odds of serious mental illness increased from 1.7 (95% CI 1.1 to 2.5) to 1.9 (95% CI 1.3 to 2.9) if the individual rated their sense of belonging as sometimes or never respectively. In addition, the improvement in the English language proficiency, higher degree of self-sufficiency, the capacity to communicate, being able to attend a place of worship weekly or more often, feeling welcomed in Australia and having friends from different ethnic/religious communities were associated with good mental health.

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Table 1 Characteristics of 2399 humanitarian migrants in the Building a New Life in Australia project, 2012–2013

Characteristics	Total (n=2399)*	General health*			Physical function*			Role-physical*			Bodily pain*				Severe mental illness*	
		Good (n=1517)	Fair (n=533)	Poor (n=349)	Good (n=1132)	Fair (n=888)	Poor (n=379)	Good (n=1184)	Fair (n=874)	Poor (n=341)	None (n=1094)	Mild (n=637)	Moderate (n=297)	Severe (n=371)	No (n=1929)	Yes (n=394)
Demographic characteristics																
Age (years) Mean±SD	35.5±13.9	31.9±12.1	39.7±14.5	44.8±14.2	31.0±11.4	37.5±14.1	44.1±15.0	31.1±11.4	37.8±14.5	44.6±14.5	30.8±11.5	35.1±13.4	41.3±14.5	45.4±13.8	34.7±13.7	39.1±14.3
Sex n (%)																
Male	1307 (54)	910 (60)	243 (46)	154 (44)	702 (62)	441 (50)	164 (43)	729 (62)	425 (49)	153 (45)	695 (64)	328 (52)	127 (43)	157 (42)	1103 (57)	160 (41)
Female	1092 (46)	607 (40)	290 (54)	195 (56)	430 (38)	447 (50)	215 (57)	455 (38)	449 (51)	188 (55)	399 (36)	309 (49)	170 (57)	214 (58)	826 (43)	234 (59)
Marital status n (%)																
Married or cohabiting	1376 (57)	799(53)	351(66)	226(65)	577(51)	555(63)	244(64)	609(51)	542(62)	225(66)	567(52)	383(60)	174(59)	252(68)	1101(57)	231(59)
Single	1023 (43)	718 (47)	182 (34)	123 (35)	555 (49)	333 (37)	133 (36)	575 (49)	332 (38)	116 (34)	527 (48)	254 (40)	123 (41)	119 (32)	828 (43)	163 (41)
Education level n (%)																
Never attended school	380 (16)	213 (14)	90 (17)	7 7(22)	161 (14)	134 (15)	85 (23)	160 (14)	142 (16)	78 (23)	149 (14)	91 (14)	58 (20)	82 (22)	304 (16)	63 (16)
≤6 Years of schooling	473 (20)	290 (19)	109 (21)	74 (21)	238 (21)	153 (17)	82 (22)	242 (21)	153 (18)	78 (23)	234 (22)	99 (21)	62 (21)	78 (21)	398 (21)	64 (16)
≥7 Years of schooling	1137 (48)	752 (51)	245 (46)	140 (40)	552 (49)	435 (49)	150 (40)	582 (50)	425 (49)	130 (39)	551 (51)	309 (49)	125 (42)	152 (41)	927 (48)	174 (44)
Trade or technical qualification beyond school	143 (6)	80 (5)	35 (7)	28 (8)	55 (5)	59 (7)	29 (8)	63 (5)	55 (6)	25 (7)	50 (5)	45 (7)	21 (7)	27 (7)	106 (6)	33 (8)
University degree	243 (10)	163 (11)	52 (10)	28 (8)	114 (10)	101 (12)	28 (8)	125 (11)	92 (11)	26 (8)	96 (9)	87 (14)	29 (10)	31 (8)	180 (9)	58 (15)
Immigration characteristics																
Country of origin n (%)																
North Africa and the Middle East	1334 (56)	735 (49)	346 (65)	253 (73)	520 (46)	562 (63)	252 (67)	564 (48)	541 (62)	229 (67)	507 (46)	357 (56)	199 (67)	271 (73)	1004 (52)	289 (73)
South-East Asia	137 (6)	99 (7)	24 (5)	14 (4)	75 (7)	53 (6)	9 (2)	78 (7)	51 (6)	8 (2)	77 (7)	46 (7)	10 (3)	4 (1)	122 (6)	8 (2)
Southern and Central Asia	829 (35)	597 (39)	156 (29)	76 (22)	472 (42)	248 (28)	109 (29)	475 (40)	260 (30)	94 (28)	452 (41)	212 (33)	81 (27)	84 (23)	715 (37)	90 (23)
Sub-Saharan Africa	93 (4)	82 (5)	7 (1)	4 (1)	61 (5)	25 (3)	7 (2)	63 (5)	21 (2)	9 (3)	55 (5)	21 (3)	6 (2)	11 (3)	83 (4)	6 (2)
Other countries	6 (0)	4 (0)	0 (0)	2 (1)	4 (0)	0 (0)	2 (1)	4 (0)	1 (0)	1 (0)	3 (0)	1 (0)	1 (0)	1 (0)	5 (0)	1 (0)
Visa subclass n (%)																
Refugee	1920 (80)	1162 (77)	465 (87)	303(87)	867 (77)	729 (82)	334 (88)	911 (77)	719 (82)	300 (88)	833 (76)	525 (82)	246 (83)	326 (88)	1535 (80)	337 (86)
SHP	99 (4)	63 (4)	15 (3)	11 (3)	45 (4)	30 (3)	14 (4)	51 (4)	28 (3)	10 (3)	49 (5)	18 (3)	8 (3)	14 (4)	78 (4)	8 (2)
Onshore pathway	380 (16)	292 (20)	53 (10)	35 (10)	220 (19)	129 (14)	31 (8)	222 (19)	127 (15)	31 (9)	212 (19)	94 (14)	43 (15)	31 (8)	316 (17)	49 (13)
Duration of residence in Australia n (%)																
<6 Months	1807 (76)	1086 (72)	431 (81)	290 (83)	808 (71)	674 (76)	325 (86)	855 (72)	668 (76)	284 (83)	780 (71)	485 (76)	228 (77)	314 (85)	1435 (74)	316 (80)
6–12 Months	224 (9)	146 (10)	53 (10)	25 (7)	108 (10)	93 (11)	23 (6)	111 (9)	87 (10)	26 (8)	104 (10)	64 (10)	28 (9)	28 (8)	187 (10)	32 (8)
>1 Year	368 (16)	285 (19)	49 (9)	34 (10)	216 (19)	121 (14)	31 (8)	218 (18)	119 (14)	31 (9)	210 (19)	88 (14)	41 (14)	29 (8)	307 (16)	46 (12)
Experience of traumas before arrival in Australia n (%)																
Yes	2062 (91)	1275 (89)	461 (91)	326 (97)	948 (88)	767 (92)	347 (95)	993 (88)	756 (92)	313 (95)	911 (88)	532 (90)	269 (94)	350 (97)	1636 (89)	372 (97)
No	215 (9)	159 (11)	47 (9)	9 (3)	131 (12)	65 (8)	19 (5)	134 (12)	65 (8)	16 (5)	125 (12)	61 (10)	18 (6)	11 (3)	196 (11)	12 (3)

*Numbers may not add to column total due to missing data.
SHP, Special Humanitarian Programme.

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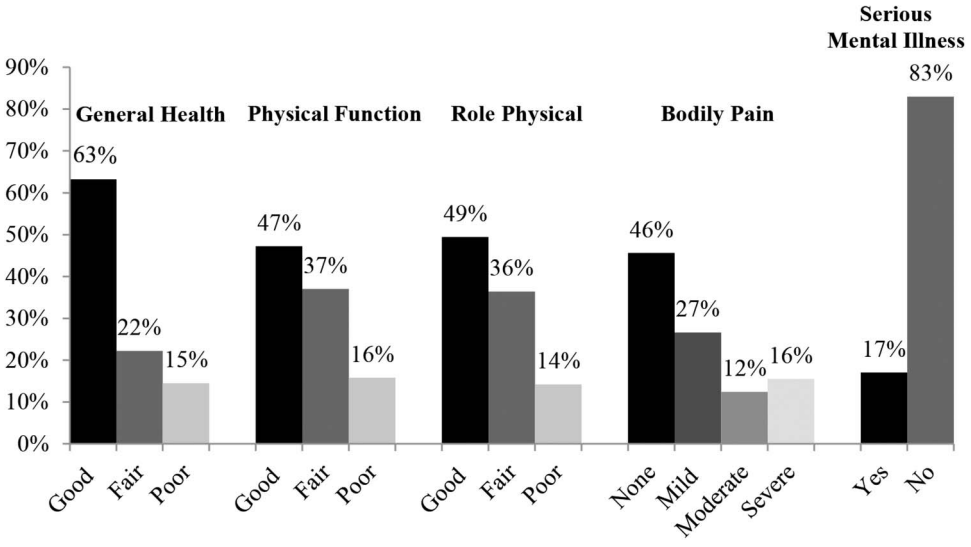

Figure 1 Self-rated physical and mental health of 2399 humanitarian migrants in the BNLA project, 2012–2013. BNLA, Building a New Life in Australia.

DISCUSSION

While the number of humanitarian entrants has increased exponentially over the last decades,[2] meeting their needs remains one of the biggest challenges in receiving countries. As the third-biggest resettlement country in the world,[1] Australia provides a good opportunity to assess the relationship between social integration and health among HMs. Social integration is a multidimensional concept and encompasses social, cultural, economic and political dimensions. However, most of existing research only measured the cultural aspect of integration.[17 19–22] Drawing from Yang's[23] social integration model, the current study extends previous research by measuring social integration more comprehensively, and assessing the associations between four dimensions of social integration and physical and mental health.

The findings of our study show that the so-called 'healthy migrant paradox' reported among non-refugee migrants was not true among HMs.[8–11] Our data particularly highlight the serious mental illness of HMs, with 17% of them probably having a serious mental illness. This finding compared unfavourably with the 2014–2015 Australian National Health Survey data, which found that 3.7% of Australian had a serious mental illness based on the K10 scores.[30] While the K6 used in our study is the truncated version of the K10, the K6 is preferred in most national surveys because of its brevity and consistency across subsample.[28] In addition, the K6 is as sensitive as the K10 in discriminating between cases and non-cases of serious mental illness.[27] Therefore, the difference in the prevalence of serious mental illness among HMs and the Australian average cannot be explained by methodological differences, but rather it may reflect the true burden of mental health among HMs in Australia.

Our results have high policy relevance for promoting resettlement services for HMs. In Australia, the Humanitarian Settlement Services Programme provides early settlement services for the first 6–12 months of resettlement.[31] The programme provides assistance on accommodation, initial food and information on health, education/language, employment and culture. To improve HMs' health, our findings suggest that fostering social integration could be an important element of resettlement services in the future. Such programmes could focus more on social capital, and self-sufficiency, to facilitate HMs' capacity to communicate with locals and their ability to make friends from different backgrounds, attend social events such as places of worship and adapt to the new environment. Social capital may increase accessibility and widen access to health information, and provide peer/social/emotional support among HMs.[32] Migrants with higher degree of self-sufficiency may know their health needs better and access health services easier. Individuals who have a high degree of self-sufficiency can define and take care of their own needs, have confidence and be able to find solutions to their health needs.[33]

However, our study has limitations. First, the health measures are based on self-report data; therefore responses may be influenced by numerous factors including personal interpretations and nuances across languages and cultures, with unavoidable recall bias. Second, while the BNLA survey covers a vast range of resettlement outcomes, it did not include the full suite of physical health items as prescribed in the SF-36. This limited the accuracy and reliability of the physical health indicators. Third, to accommodate the diverse cultural and linguistic backgrounds of the participants, all of survey materials were translated into 14 languages and bilingual interviewers and accredited interpreters were

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Table 2 Social integration of 2399 humanitarian migrants in the Building a New Life in Australia project, 2012–2013

Social Integration	Total (n=2399)*	General health*			Physical function*			Role-physical*			Bodily pain*				Severe mental illness*	
		Good (n=1517)	Fair (n=533)	Poor (n=349)	Good (n=1132)	Fair (n=888)	Poor (n=379)	Good (n=1184)	Fair (n=874)	Poor (n=341)	None (n=1094)	Mild (n=637)	Moderate (n=297)	Severe (n=371)	No (n=1929)	Yes (n=394)
Economic integration																
Employment status n (%)																
Unemployed	2230 (94)	1371 (91)	521 (98)	338 (99)	1013 (90)	851 (97)	366 (99)	1065 (91)	835 (97)	330 (99)	990 (91)	593 (94)	286 (97)	361 (99)	1790 (93)	376 (98)
Employed	145 (6)	131 (9)	10 (2)	4 (1)	112 (10)	29 (3)	4 (1)	112 (10)	28 (3)	5 (2)	96 (9)	36 (6)	9 (3)	4 (1)	131 (7)	9 (2)
Main source of income n (%)																
Salary	162 (7)	129 (9)	18 (4)	15 (4)	110 (10)	43 (5)	9 (3)	109 (9)	39 (5)	14 (4)	99 (9)	40 (7)	11 (4)	12 (3)	138 (7)	16 (4)
Government payments	2111 (90)	1307 (88)	485 (93)	319 (94)	971 (87)	791 (91)	349 (95)	1018 (87)	782 (92)	311 (94)	941 (88)	546 (89)	276 (94)	348 (95)	1699 (89)	362 (94)
Other	76 (3)	53 (4)	16 (3)	7 (2)	33 (3)	32 (4)	11 (3)	40 (3)	30 (4)	6 (2)	35 (3)	29 (5)	6 (2)	6 (2)	65 (3)	7 (2)
Current housing arrangement n (%)																
Temporary	237 (11)	182 (12)	49 (9)	26 (8)	137 (12)	92 (11)	28 (8)	143 (12)	91 (11)	23 (7)	131 (12)	63 (10)	36 (12)	27 (7)	205 (11)	41 (11)
Less than 6-month lease/contract	855 (36)	532 (36)	179 (34)	144 (42)	421 (38)	282 (32)	152 (41)	441 (38)	280 (33)	134 (40)	397 (37)	201 (32)	107 (37)	150 (41)	663 (35)	167 (44)
More than 6-month lease/contract	1199 (51)	746 (50)	280 (53)	173 (50)	529 (48)	482 (55)	188 (50)	551 (48)	474 (55)	174 (52)	520 (49)	353 (56)	143 (49)	183 (50)	1000 (53)	168 (44)
Other	43 (2)	24 (2)	16 (3)	3 (1)	20 (2)	16 (2)	7 (2)	26 (2)	11 (1)	6 (2)	22 (2)	9 (1)	7 (2)	5 (1)	32 (2)	7 (2)
Number of financial hardships n (%)																
0	1306 (57)	899 (62)	257 (52)	150 (45)	701 (65)	454 (54)	151 (43)	735 (65)	432 (52)	139 (43)	695 (66)	318 (54)	136 (48)	157 (45)	1137 (62)	143 (39)
1	415 (18)	250 (17)	107 (22)	58 (18)	179 (17)	155 (18)	81 (23)	189 (17)	157 (19)	69 (22)	159 (15)	114 (19)	68 (24)	74 (21)	327 (18)	71 (19)
2	286 (13)	160 (11)	63 (13)	63 (19)	104 (10)	121 (14)	61 (17)	109 (10)	120 (15)	57 (18)	96 (9)	86 (15)	44 (15)	60 (17)	204 (11)	73 (20)
≥3	271 (12)	144 (10)	67 (14)	60 (18)	99 (9)	113 (13)	59 (17)	100 (9)	115 (14)	56 (17)	98 (9)	76 (13)	37 (13)	60 (17)	179 (10)	81 (22)
Acculturation																
Language proficiency improvement Mean±SD	1.1±1.9	1.3±2.0	0.8±1.7	0.5±1.6	1.4±1.9	1.0±1.8	0.6±1.6	1.3±1.9	1.0±1.8	0.5±1.6	1.4±2.0	1.1±1.9	0.8±1.7	0.6±1.5	1.2±1.9	0.6±1.6
Self-sufficiency Mean±SD	15.1±5.9	16.3±6.1	13.8±5.0	12.2±4.7	16.6±6.1	14.5±5.5	12.4±4.9	16.6±6.1	14.3±5.3	12.3±5.1	16.7±6.2	14.8±5.4	13.7±5.4	12.4±4.7	15.6±5.9	12.8±4.9
Participation in study or job training in Australia n (%)																
Yes	354 (15)	251 (17)	68 (13)	35 (10)	183 (16)	132 (15)	39 (11)	195 (17)	122 (14)	37 (11)	184 (17)	100 (16)	36 (12)	34 (9)	279 (15)	50 (13)
No	2015 (85)	1245 (83)	463 (87)	301 (90)	935 (84)	750 (85)	369 (89)	975 (83)	742 (86)	298 (89)	896 (83)	533 (84)	257 (88)	329 (91)	1633 (85)	336 (87)
Self-identity																
Sense belonging in Australia n (%)																
Never	636 (28)	365 (25)	156 (31)	115 (35)	250 (23)	281 (33)	105 (29)	269 (23)	278 (33)	89 (27)	244 (23)	196 (32)	87 (31)	109 (31)	454 (24)	167 (44)
Most of time	594 (26)	372 (25)	141 (28)	81 (24)	268 (25)	228 (27)	98 (27)	280 (24)	237 (28)	77 (24)	262 (25)	170 (28)	80 (28)	82 (23)	488 (26)	93 (25)
Always	1081 (47)	730 (50)	215 (42)	136 (41)	576 (53)	344 (40)	161 (44)	599 (52)	320 (38)	162 (49)	553 (52)	246 (40)	116 (41)	166 (47)	927 (50)	118 (31)
Feel welcomed in Australia n (%)																
Never	410 (18)	222 (15)	105 (20)	83 (24)	146 (13)	178 (21)	86 (23)	164 (14)	170 (20)	76 (14)	136 (13)	138 (22)	57 (20)	79 (22)	280 (15)	118 (31)
Most of time	665 (28)	435 (29)	143 (27)	87 (25)	293 (26)	273 (32)	99 (27)	303 (26)	280 (33)	303 (26)	280 (26)	197 (32)	90 (31)	98 (27)	552 (29)	100 (26)
Always	1278 (54)	830 (56)	276 (53)	172 (50)	678 (61)	413 (48)	187 (50)	699 (60)	403 (47)	699 (60)	656 (61)	290 (46)	143 (49)	189 (52)	1080 (57)	163 (43)
Experience discrimination n (%)																
Yes	113 (5)	75 (5)	21 (4)	17 (5)	51 (5)	46 (5)	16 (4)	52 (4)	48 (6)	13 (4)	48 (4)	32 (5)	17 (6)	16 (4)	76 (4)	35 (9)
No	2250 (95)	1422 (95)	502 (96)	326 (95)	1069 (95)	823 (95)	358 (96)	1123 (96)	806 (94)	321 (96)	1036 (96)	591 (95)	273 (94)	350 (96)	1833 (96)	352 (91)

Continued

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Table 2 Continued

Social Integration	Total (n=2399)*	General health* Good (n=1517)	Fair (n=533)	Poor (n=349)	Physical function* Good (n=1132)	Fair (n=888)	Poor (n=379)	Role-physical* Good (n=1184)	Fair (n=874)	Poor (n=341)	Bodily pain* None (n=1094)	Mild (n=637)	Moderate (n=297)	Severe (n=371)	Severe mental illness* No (n=1929)	Yes (n=394)
Social capital																
Capacity of communication with locals Mean±SD	6.6±2.2	6.9±2.2	6.2±2.1	5.8±2.1	7.0±2.2	6.5±2.1	5.7±2.2	7.0±2.2	6.5±2.0	5.6±2.2	7.0±2.2	6.6±2.0	6.2±2.0	5.8±2.1	6.7±2.2	5.8±2.0
Community support Mean±SD	5.0±2.2	5.1±2.3	5.0±2.2	4.8±2.0	7.0±2.2	6.5±2.1	5.7±2.2	5.0±2.2	5.1±2.2	4.9±2.1	5.1±2.3	5.2±2.3	4.7±2.0	4.9±2.1	5.0±2.2	5.0±2.2
How often attend place of worship n (%)																
Never	582 (25)	384 (26)	113 (22)	85 (25)	295 (27)	192 (23)	95 (26)	293 (26)	200 (24)	293 (26)	267 (26)	142 (23)	84 (29)	89 (25)	451 (24)	113 (30)
Rarely	646 (28)	395 (27)	162 (31)	89 (26)	313 (29)	233 (27)	100 (27)	330 (29)	227 (27)	330 (29)	310 (30)	166 (27)	73 (25)	97 (27)	534 (29)	97 (26)
Monthly	727 (32)	458 (32)	156 (30)	113 (33)	317 (29)	288 (34)	122 (33)	347 (31)	274 (33)	347 (31)	324 (31)	207 (34)	78 (27)	118 (33)	585 (31)	117 (31)
Weekly or more often	356 (15)	216 (15)	86 (17)	54 (16)	165 (15)	140 (16)	51 (14)	165 (15)	142 (17)	165 (15)	148 (14)	96 (16)	53 (18)	59 (16)	304 (16)	48 (13)
Type of friends in Australia n (%)																
Mostly form my ethnic/religious community	1110 (47)	669 (45)	265 (51)	176 (52)	519 (47)	398 (46)	193 (52)	537 (46)	400 (47)	173 (52)	494 (46)	289 (47)	144 (50)	183 (50)	907 (48)	177 (46)
Mostly form other ethnic/religious community	83 (4)	59 (4)	18 (3)	6 (2)	38 (3)	37 (4)	8 (2)	43 (4)	32 (4)	8 (2)	39 (4)	25 (4)	10 (4)	9 (3)	70 (4)	11 (3)
A mixture	798 (34)	555 (38)	159 (30)	84 (25)	410 (37)	295 (34)	93 (25)	431 (37)	295 (35)	72 (22)	394 (37)	226 (36)	90 (31)	88 (24)	682 (36)	92 (24)
Do not have any friends	350 (15)	194 (13)	82 (16)	74 (22)	143 (13)	133 (15)	74 (20)	150 (13)	123 (15)	77 (23)	140 (13)	81 (13)	44 (15)	85 (23)	235 (12)	103 (27)

*Numbers may not add to column total due to missing data

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Table 3 OR and 95% CI for the association between social integration and self-rated health, Building a New Life in Australia project, 2012–2013

	General health		Physical functioning		Role-physical		Bodily pain		Serious mental illness	
Factors	**OR (95% CI)**	**aOR (95% CI)***	**OR (95% CI)**	**aOR (95% CI)***	**OR (95% CI)**	**aOR (95% CI)***	**OR (95% CI)**	**aOR (95% CI)***	**OR (95% CI)**	**aOR (95% CI)***
Economic integration										
Financial hardships										
0	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
1	0.7 (0.6 to 0.9)**	0.7 (0.6 to 1.0)*	0.6 (0.5 to 0.8)***	0.6 (0.4 to 0.7)***	0.6 (0.5 to 0.8)***	0.6 (0.5 to 0.8)***	0.6 (0.5 to 0.7)***	0.6 (0.4 to 0.7)***	1.7 (1.3 to 2.4)**	1.5 (1.0 to 2.3)*
2	0.5 (0.4 to 0.7)***	0.4 (0.3 to 0.6)***	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.5)***	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.5)***	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.5)***	2.8 (2.1 to 3.9)***	2.5 (1.7 to 3.8)***
≥3	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.6)***	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.6)***	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.5)***	0.5 (0.4 to 0.6)***	0.4 (0.3 to 0.6)***	3.6 (2.6 to 4.9)***	4.4 (2.9 to 6.7)***
Main source of income										
Other	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Salary	0.7 (0.4 to 1.1)	0.8 (0.3 to 2.0)	2.7 (1.6 to 4.5)***	2.6 (1.2 to 5.8)*	1.7 (1.0 to 2.9)	1.4 (0.6 to 3.0)	1.6 (0.9 to 2.6)	1.6 (0.7 to 3.5)	1.1 (0.4 to 2.7)	1.0 (0.3 to 3.7)
Government payments	1.6 (0.9 to 3.0)	1.4 (0.7 to 2.7)	1.0 (0.7 to 1.6)	2.5 (1.4 to 4.4)**	0.8 (0.5 to 1.2)	1.7 (1.0 to 3.0)	0.8 (0.5 to 1.2)	1.9 (1.1 to 3.2)*	2.0 (0.9 to 4.4)	0.7 (0.3 to 1.9)
Employment status										
Unemployed	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Employed	5.9 (3.4 to 10.3)***	1.6 (0.8 to 3.4)	4.2 (2.8 to 6.2)***	1.3 (0.7 to 2.4)	3.8 (2.5 to 5.6)***	1.8 (0.9 to 3.4)	2.7 (1.9 to 3.8)***	1.2 (0.6 to 2.2)	0.3 (0.2 to 0.6)**	0.8 (0.3 to 2.4)
Current housing arrangement										
Other	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Temporary	1.6 (0.8 to 3.1)	1.8 (0.7 to 4.7)	1.4 (0.7 to 2.5)	1.2 (0.5 to 2.9)	0.9 (0.5 to 1.7)	0.5 (0.2 to 1.3)	1.0 (0.6 to 1.9)	0.8 (0.4 to 2.0)	0.9 (0.4 to 2.2)	1.0 (0.3 to 3.4)
<6-month lease/contract	1.1 (0.6 to 1.9)	1.7 (0.7 to 4.0)	1.1 (0.6 to 1.9)	1.2 (0.6 to 2.8)	0.7 (0.4 to 1.3)	0.5 (0.2 to 1.2)	0.8 (0.5 to 1.4)	0.9 (0.4 to 2.0)	1.2 (0.5 to 2.7)	0.8 (0.3 to 2.7)
>6-month lease/contract	1.1 (0.6 to 2.0)	1.8 (0.8 to 4.4)	0.9 (0.5 to 1.7)	1.0 (0.5 to 2.3)	0.6 (0.3 to 1.1)	0.4 (0.2 to 1.0)*	0.8 (0.5 to 1.4)	0.8 (0.4 to 1.9)	0.8 (0.3 to 1.8)	0.6 (0.2 to 2.1)
Acculturation										
Language proficiency improvement	1.2 (1.2 to 1.3)***	1.1 (1.0 to 1.2)**	1.2 (1.1 to 1.1)***	1.0 (1.0 to 1.1)	1.2 (1.1 to 1.2)***	1.1 (1.0 to 1.1)*	1.2 (1.1 to 1.2)***	1.1 (1.0 to 1.1)*	0.8 (0.8 to 0.9)***	0.9 (0.9 to 1.0)*
Self to sufficiency	1.1 (1.1 to 1.1)***	1.0 (1.0 to 1.1)***	1.1 (1.1 to 1.1)***	1.1 (1.0 to 1.1)***	1.1 (1.1 to 1.1)***	1.1 (1.0 to 1.1)***	1.1 (1.1 to 1.1)***	1.0 (1.0 to 1.1)***	0.9 (0.9 to 0.9)***	0.9 (0.9 to 1.0)**
Participation in study or job training in Australia										
Yes	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
No	0.7 (0.5 to 0.8)**	1.0 (0.7 to 1.4)	0.8 (0.6 to 1.0)*	1.1 (0.8 to 1.4)	0.7 (0.6 to 0.9)**	1.0 (0.7 to 1.3)	0.7 (0.6 to 0.9)**	1.0 (0.8 to 1.4)	1.1 (0.8 to 1.6)	0.8 (0.5 to 1.3)
Self-identity										
Sense belong in Australia										
Always	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Most of time	0.8 (0.7 to 1.0)	0.8 (0.6 to 1.0)	0.8 (0.6 to 0.9)**	0.9 (0.7 to 1.1)	0.8 (0.7 to 1.0)*	1.0 (0.8 to 1.3)	0.8 (0.7 to 1.0)	0.9 (0.7 to 1.2)	1.5 (1.1 to 2.0)**	1.7 (1.1 to 2.5)**
Never	0.6 (0.5 to 0.8)***	0.9 (0.6 to 1.2)	0.6 (0.5 to 0.8)***	1.1 (0.8 to 1.4)	0.7 (0.6 to 0.8)***	1.2 (0.9 to 1.6)	0.7 (0.6 to 0.8)***	1.1 (0.8 to 1.4)	2.9 (2.2 to 3.8)***	1.9 (1.3 to 2.9)**
Feel welcomed in Australia										
Always	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Most of time	1.0 (0.8 to 1.2)	1.0 (0.8 to 1.3)	0.8 (0.6 to 0.9)**	0.7 (0.5 to 0.9)**	0.8 (0.6 to 0.9)**	0.7 (0.6 to 0.9)*	0.8 (0.6 to 0.9)**	0.7 (0.5 to 0.9)**	1.2 (0.9 to 1.6)	0.9 (0.6 to 1.3)
Never	0.6 (0.5 to 0.8)***	0.6 (0.5 to 0.9)**	0.5 (0.4 to 0.7)***	0.6 (0.4 to 0.8)***	0.6 (0.5 to 0.7)***	0.6 (0.4 to 0.8)***	0.6 (0.5 to 0.7)***	0.5 (0.4 to 0.7)***	2.8 (2.1 to 3.7)***	1.7 (1.1 to 2.5)*
Experience discrimination										
Yes	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
No	0.9 (0.6 to 1.3)	1.1 (0.7 to 1.8)	1.0 (0.7 to 1.5)	1.1 (0.8 to 1.4)	1.1 (0.7 to 1.5)	1.1 (0.7 to 1.7)	1.1 (0.8 to 1.6)	1.1 (0.7 to 1.7)	0.4 (0.3 to 0.6)***	0.7 (0.4 to 1.3)
Social capital										
Capacity of communication with locals	1.2 (1.2 to 1.3)***	1.0 (1.0 to 1.1)**	1.2 (1.1 to 1.2)***	1.1 (1.0 to 1.1)*	1.2 (1.2 to 1.2)***	1.1 (1.0 to 1.2)**	1.2 (1.2 to 1.2)***	1.1 (1.0 to 1.1)	0.8 (0.8 to 0.9)***	0.9 (0.8 to 1.0)**
Community support	1.0 (1.0 to 1.1)*	1.0 (1.0 to 1.1)	1.0 (1.0 to 1.1)*	1.0 (0.9 to 1.0)	1.0 (1.0 to 1.0)	1.0 (0.9 to 1.0)	1.0 (1.0 to 1.1)	1.0 (1.0 to 1.0)	1.0 (0.9 to 1.0)	1.1 (1.0 to 1.1)
Attend place of worship										
Weekly or more often	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Monthly	1.1 (0.8 to 1.4)	0.8 (0.6 to 1.1)	0.9 (0.7 to 1.1)	0.7 (0.5 to 1.0)*	1.0 (0.8 to 1.3)	1.0 (0.7 to 1.3)	1.1 (0.9 to 1.5)	0.9 (0.7 to 1.3)	1.3 (0.9 to 1.8)	1.6 (1.0 to 2.6)*
Rarely	1.0 (0.8 to 1.3)	0.8 (0.6 to 1.1)	1.0 (0.8 to 1.3)	0.9 (0.7 to 1.3)	1.2 (0.9 to 1.5)	1.0 (0.7 to 1.4)	1.3 (1.0 to 1.6)*	1.1 (0.8 to 1.5)	1.1 (0.8 to 1.7)	1.6 (1.0 to 2.5)
Never	1.2 (0.9 to 1.6)	0.8 (0.6 to 1.2)	1.1 (0.9 to 1.4)	1.0 (0.7 to 1.4)	1.1 (0.9 to 1.4)	0.9 (0.7 to 1.2)	1.1 (0.9 to 1.4)	1.0 (0.7 to 1.3)	1.6 (1.1 to 2.3)*	2.1 (1.3 to 3.4)**

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Table 3 Continued

Factors	General health		Physical functioning		Role-physical		Bodily pain		Serious mental illness	
	OR (95% CI)	aOR (95% CI)*	OR (95% CI)	aOR (95% CI)*	OR (95% CI)	aOR (95% CI)*	OR (95% CI)	aOR (95% CI)*	OR (95% CI)	aOR (95% CI)*
Type of friends in Australia										
Do not have any friend	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Mostly form my ethnic/ religious community	1.3 (1.0 to 1.6)*	0.9 (0.6 to 1.2)	1.3 (1.0 to 1.6)*	1.0 (0.7 to 1.3)	1.3 (1.1 to 1.7)*	1.0 (0.7 to 1.3)	1.3 (1.1 to 1.7)**	1.0 (0.8 to 1.4)	0.4 (0.3 to 0.6)***	0.7 (0.5 to 1.1)
Mostly form other ethnic/ religious community	2.1 (1.3 to 3.6)**	1.0 (0.5 to 1.9)	1.4 (0.9 to 2.3)	0.8 (0.5 to 1.5)	1.7 (1.1 to 2.6)*	0.9 (0.5 to 1.6)	1.6 (1.0 to 2.6)*	0.9 (0.5 to 1.6)	0.4 (0.2 to 0.7)**	0.7 (0.3 to 1.7)
A mixture	1.9 (1.5 to 2.5)***	0.8 (0.6 to 1.2)	1.6 (1.3 to 2.1)***	0.9 (0.7 to 1.3)	1.8 (1.4 to 2.3)***	1.0 (0.7 to 1.4)	1.7 (1.4 to 2.2)***	0.9 (0.7 to 1.2)	0.3 (0.2 to 0.4)***	0.6 (0.4 to 1.0)*

*Adjusted for age, sex, marital status, education level, country of origin, visa subclass, duration of residence in Australia and exposure to traumatic events before arrival in Australia.
*p<0.05; **p<0.01; ***p<0.001.
aOR, adjusted OR; Ref, reference group.

also involved in data collection. Although multiple stages of independent checking have been performed for quality assurance of the translation, participants still faced barriers on understanding of Western scales and concepts,[25] which may impact reliability of measurement. Although our data were found to have strong internal consistency, the reliability of the translated versions of the questionnaire cannot be established because data are only available for the English version. The sample is limited to recent HMs resettling in Australia. Therefore, our findings are not generalisable to long-term resettled HMs and economic migrants. Finally, this was a cross-sectional study, therefore we can only assess the association between social integration and health, and causal association cannot be implied. Studies using follow-up data of the BNLA study that will be released in the future could be conducted to provide support for the causal effects of social integration on HMs' health.

CONCLUSION

Greater social integration in a variety of dimensions was associated with better physical and mental health of HMs before and after controlling for a range of characteristics. Embedding social integration activities into resettlement programmes for HMs would be the first step to reducing migration-related inequities in physical and mental health in Australia and other HMs resettlement countries.

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