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Mental Well-Being of International Migrants to Japan: a Systematic Review

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Abstract

Background Migration is a stressful process of resettlement and acculturation that can often negatively impact the mental health of migrants. In Japan, international migration is growing steadily amid an aging domestic population experiencing severe labor shortages.

Objective To identify the contemporary barriers to, and facilitators of, mental well-being among the migrant population in Japan.

Design Systematic review

Setting Japan

Data sources and eligibility criteria Electronic databases PubMed, ProQuest, Web of Science, Ichushi and J-Stage were systematically searched for original research articles published in English or Japanese between January 2000 and September 2018. Full-texts of relevant articles were screened and references of the included studies were then hand-searched for further admissible publications on the mental well-being of international migrants in Japan. Study characteristics, mental well-being facilitators and barriers as well as policy recommendations were synthesized into categorical observations and were then thematically analyzed.

Results Fifty-five studies (23 published in English), surveying a total of 8649 migrants, were identified. The most commonly studied migrant nationalities were Brazilian (36%), followed by Chinese (27%) and Filipino (8%). Thematic analysis of barriers to mental well-being among migrants chiefly identified “language difficulties”, “being female” and “lack of social support”, whereas the primary facilitators were “social networks” followed by

"cultural identity". Policy recommendations for authorities included more migrant support services and transcultural awareness among the Japanese public.

Conclusion Access to social support networks of various types appear to be the most important factor affecting the mental well-being of international migrants in Japan. Those in positions of authority throughout Japanese society should take action to promote such connections to foster a more inclusive and multicultural society amid rapid demographic change.

PROSPERO registration number CRD42018108421

Keywords: Mental Well-being; Japan; Migration

Article Summary

Strengths and limitations of this study

- Our study is the first to comprehensively screen and synthesizes available research, published both in Japanese and English, on the mental well-being of international migrants to Japan.
- Our study describes contemporary migrant health and social support networks were found to be the key facilitator of mental well-being.
- The cross-sectional nature of the included studies limits the value in supporting causal effects and generalizability.
- While English and Japanese databases were surveyed, grey literature was not comprehensively searched for relevant titles.

Introduction

Global migration has increased markedly in recent decades and international migrants now constitute 3.4% of the global population.[1] International migrants are considered to be

"any person who lives temporarily or permanently in a country where he or she was not born, and has acquired some significant social ties to [their] new location".[2] Therefore migrants include non-indigenous people who are long-term immigrants, organizational expatriates, international students and migrant workers as well as forced migrants such as asylum seekers and refugees. While motivated by push and pull factors based on opportunity for a better life, international migration has been well-documented to be a stressful, multi-factorial process that can adversely affect health.[2-4] The 'right to health' of migrants is enshrined in the Declaration of Alma-Ata (1978) and states receiving countries should take a comprehensive approach to health care of such sojourners beyond basic infectious disease control.[5] Accordingly, migration is increasingly recognized as a structural socioeconomic force that influences health outcomes as a social determinant of general health and mental health, in particular.[6, 7]

As the world's third largest economy, Japan was home to 2.6 million international migrants in June 2018. This figure represents almost 2% of the national population and about 200,000 foreign nationals settled during that year.[8] While the number of foreign residents settling in Japan continues to accelerate, the total population of Japan is predicted to decline by 31% from a peak of 126 million in 2016 to 87 million by 2060.[9] Japan is a model for the human society in pending demographic crises as the first nation in human history to become "super-aged" and experience population decline. Other developed nations like Germany and Italy, are on a similar demographic trajectory and "super-aging" will create a swift increase in the proportion of comparatively young foreign national populations.[10] However, unlike other developed countries with a history of large-scale,

institutional health research that includes non-citizens,[11] in Japan, only exploratory research has been conducted on the health of migrants.

Facing such a demographic reality, the Japanese government has begun to publicly acknowledge the need for more foreign workers; however, structural issues continue to perturb the humanistic integration of international migrants. For example, a comprehensive 2017 survey showed that 30% of foreign residents had experienced discrimination in Japan, with 40% having been rebuffed when seeking housing and 25% had been denied a job due to their nationality.[12] Additionally, the Migration Integration Policy Index (MPIX) recently highlighted a series of strict working visa requirements and a culture of overwork and harassment leading to occupational morbidity; [13] such 'push' factors may affect the mental health of migrants as part of Japanese society.

The World Health Organization (WHO) defines mental health as, "a state of well-being where every individual can realize his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community".[14] Mental well-being is a continuum within mental health open to sociocultural interpretation and may include concepts such as contentment, absence of negative life determinants, absence of disease, or economic prosperity.[14]

The Japanese nation has a homogeneous cultural history with a unique language compared to well-studied multicultural Western countries. For this reason, mental well-being and the importance of mental support availability, such as relationships with family, friends, colleagues, the community and civil society may be unique in a generally non-English-speaking context. To the best of our knowledge, there has been no synthesis of the

literature on the mental health or well-being of international migrants to Japan. In order to examine the social determinants of mental well-being among such migrants, the barriers to, and facilitators of, their mental health well-being were systematically reviewed. Our findings are a timely addition to the growing global health discipline of migrant health and may also provide authorities with an evidence base for further immigration reform and social design.

Methods

Study description

This systematic review of heterogeneous observational studies conducted in accordance with the 2009 Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) reporting guidelines.[15] The study protocol was registered at PROSPERO in September 2018 (https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=108421, registration No. CRD42018108421). As raw human health data was not used in this research, ethical approval was not required.

Search strategy

Electronic databases were searched for publications published between January 2000 and September 2018. This timeframe was chosen to include studies that reflect the contemporary migrant population of Japan to be more useful in directing current social policy. The following databases were queried: PubMed, UTokyo Resource Explorer (UTREE; includes Proquest, SpringerLink, ScienceDirect) and Web of Science; as well as

Japanese databases Igaku-chuo-zasshi (Ichushi; https://search.jamas.or.jp/) and J-STAGE (https://www.jstage.jst.go.jp/) which each citing over 300,000 articles per year from 2,500 Japanese biomedical journals. Search was completed in September 2018, and the English as well as Japanese search terms are listed in Table 1. Both sets of search terms were used to query each database.

Table 1. Search Terms

English	Japanese
"Mental health" OR "Psychology" OR "Mental well-being" AND	"精神保健" OR "メンタルヘルス" OR "心の健康" OR "精神衛生" AND
"Migrant" OR "Immigrant" OR "Expatriate" OR "Foreigner" OR "Refugee" OR "Foreign resident" OR "International student" AND	"居住者" OR "駐在員" OR "労働者" OR "移住者" OR "難民" OR "留学生" OR " 在留外国人" AND
"Japan"	"在日" OR "日本における外国人" OR "在留"

Inclusion and exclusion criteria

Study inclusion criteria were: 1) original research assessing at least one aspect of mental health among the international migrant population of Japan; 2) quantitative and/or qualitative methodologies examining more than a single migrant, including systematic reviews; 3) studies published in English or Japanese. Exclusion criteria were 1) conference proceedings, expert opinions, single case reports or reviews; 2) analysis of international tourists. *Migrant* was defined in line with the Japanese government guidelines as a foreign national living in Japan for three months or more.[8] Mental health was assessed using a

variety of standardized methods including epidemiological surveys, interviews and medical records.

Selection and retrieval process

Based upon the above selection criteria, two researchers (RM, YT) independently evaluated each title and abstract for inclusion. After removing duplicates, 1,255 compiled titles were screened for relevance to the study topic, then selected abstracts were read to confirm relevance. Any ambiguities throughout the selection process were discussed with a third researcher (KICO) and arbitrated through group consensus. After review, 80 titles were chosen for full text review by the two primary researchers. Full texts were reviewed to ensure the publications met all inclusion criteria. After this process, the remaining 55 full texts were included in data synthesis. References in these articles were hand-searched revealing 28 potentially useful references. All full texts were located via the University of Tokyo library system or in case of difficult to locate manuscripts, by contacting the first author directly. Figure 1 is a flowchart of our screening process.

Data extraction

Two review libraries of included studies were made, one of the physical copies and one of PDF files using Mendeley referencing software. Data were extracted independently into Excel by the primary researchers (RM, YT). Extracted data (Table 2) included first author, year of publication, study design, study area (city or region), subject nationality (at most four largest groups are specified), number of subjects, mental health variable assessed, epidemiological tool employed, significant barriers as well as facilitators of mental well-being and subsequent policy recommendations. Non-significant factors discussed by the

study authors were not included. Japanese publications are also noted in Table 2. Comparative population sizes, nationalities and location are noted where appropriate. Strategies and data presentation were discussed by researchers throughout the process to harmonize search and extraction strategies.

Quality assessment

Study quality was assessed during data extraction using five specific criteria under the guidance of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) and the Newcastle Ottawa Quality Assessment Scale for Cohort and Cross-Sectional Studies (Supplementary Table 1). Our quality criteria examined both completeness of study analysis and general study design. These criteria were as follows: consideration of pre-migration factors, consideration of post-migration factors; inclusion of a non-migrant comparison group; use of a valid measurement tool; justification of satisfactory sample size. A score of 1–5 were assigned to each study based on these criteria. Publications with scores 1-2 were labelled 'poor quality', 3 were considered 'average quality' and 4-5 were of 'good quality'.

Data analysis

In total, 55 full articles were included in our analysis. Due to the significant heterogeneity among study themes, populations and methodologies, a thematic synthesis was conducted instead of a meta-analysis. We did not pre-define the way in which the relationships among concepts were evaluated within studies and accepted outcome measures based on the author's qualitative and/or quantitative assessment. Thematic analysis was used to group

barriers and facilitators identified by included studies to have a significant association with their respective mental health variable of interest.

Results

Description of studies

In total, 55 studies examining the mental well-being of international migrants in Japan were included in this review; surveying a total of 8649 migrants (excluding those surveyed in two systematic reviews, each reviewing several thousand migrants). All subjects were recruited from the community or retrospectively from medical records. On average three studies per year (range, 1 to 5) were consistently published on this topic since 2000. Of the included studies, 23 were published in English while the remaining were in Japanese. Their study designs were cross-sectional (40; one in four utilizing a comparative population), qualitative (7), case series (3), mixed methods (3) and systematic review (2). Most studies were conducted in specific major metropolitan areas, such as Tokyo, Osaka, Sapporo, etc. As study location was sometimes anonymized, it was inferred that almost all studies were completed within central Honshu in an urban setting. The number of subjects per study ranged from 3–1252, with a median size of 119. Importantly, a small number of migrants (<75) were explicitly not enrolled in a health insurance plan; the only studies that listed this variable were those of Nepalese or Brazilians migrants.

Sample nationalities

Of the total 8649 migrants surveyed, 36% were Brazilian, 27% Chinese and 8% Filipino. Each nationality was exclusively studied in 14, 10, and 3 publications, respectively. The

remaining 28 studies examined a mixed international migrant population. The four most numerous nationalities from each report were specifically extracted from a heterogeneous sample population, any remaining nationalities were identified as 'various' in Table 2.

Mental health variables and tools

Almost every observational study employed some unvalidated survey questions in addition to at least one previously validated survey tool (in part or whole). Non-validated questions were marked as a 'questionnaire' tool in Table 2. Additionally, 33 epidemiological tools used to measure mental well-being are noted, with an abbreviation legend in Supplementary Table 2. The epidemiological tool 'medical records' was used to denote studies where migrants were diagnosed with a mental health disorder by a trained healthcare professional and then those patient records were retrospectively analyzed.

Grouping trends

There were 14 studies examining international students studying in Japan. Eleven studies exclusively examined migrant workers; four of these studies were on the mental well-being of Economic Partnership Agreement (EPA) care workers. Ten studies enrolled only women; eight of those exclusively analyzed mothers. The remaining nine studies were of general migrant populations of a single (5) or various (4) nationality. Remarkably, there were eight studies specifically examining Chinese international students in Japan, making them the most studied nation-specific migrant subgrouping.

Thematic analysis

Many more barriers than facilitators to mental well-being were cited among the included studies and multiple themes were often described in a single study.

Barriers

Among the included studies, the most common barrier was trouble communicating in Japanese as 10 studies described such difficulty as negatively impacting mental health. These studies cited language barriers creating stress of managing daily life or trouble making describing symptoms in a medical environment. The next most common barrier was a lack of support, either from teachers,[31] employers,[46, 55] family,[60] or healthcare professionals.[58, 59] These findings were very similar to a described lack of social networks (isolation or living alone) described in 11 studies. The third most common barrier to mental well-being was 'being female' cited in nine studies. Nine studies also mentioned various sources of stress, like acculturation,[32] child-rearing,[58] or finances.[39] Occupational stress and discrimination were each mentioned in four studies along with age over 30 and living in Japan for more than one year each described in two studies.

Facilitators

Social and support networks were found to be the most robust facilitator of mental well-being. Social networks and support systems as well as related terms to these two concepts were mentioned 25 times as statistically significant outcomes. Some examples of such

support included in study, job or daily life,[33, 53] living with family versus living alone,[58, 75] connecting with friends,[63, 84] and maintaining with migrant community.[56] Occupational factors such as job satisfaction were noted nine times. Facilitators mentioned four times or fewer included: strong cultural identity, cultural adaptability, longer stay in Japan, coping skills, age under 30 years and Japanese fluency. Remarkably, 'being female' was also found to be a facilitator in one study.

Policy Recommendations

Two main categories of policy recommendations were identified: calls for the creation of various support systems targeted at the migrant population by the government and calls for transcultural education of the public about migrants. Several studies set forth both sets of conclusions. Proposed support systems were medical (15), educational (7), occupational (3) and general (10). The types of transcultural education authors described included fostering awareness of migrant cultural backgrounds and promoting a positive image of international migrants in mass media.

Quality of studies

Seventeen studies were found to be of high quality in terms of their ability answer our study questions, while 33 were of average quality. This difference was due primarily to a failure to examine pre-migratory factors or employ a comparison group. Only four studies were considered of low quality mainly due to their unjustified small sample size.

Discussion

In this study, thematic analysis demonstrated the access to social support to be the biggest barrier to, or facilitator of, mental well-being among international migrants in Japan. Several other factors such as length of stay, language skills and discrimination were also found to impact their mental well-being. Based on their findings, researchers often then made recommendations for the creation of more migrant-focused support programs and transcultural training for the Japanese public to reduce such health gaps.

Psychosomatic symptoms, such as depression, among other mental disruptions were found to be significantly associated with a lack of support. For example, in a few studies those without social support were reluctant to seek medical consultation perhaps due to language barriers or encouragement from others.[42] Additionally, stress was reported to originate from many sources including: study,[34] child rearing,[63] family,[60] occupation,[61] and cultural adjustment.[42] These findings demonstrate the importance of social support similar to the results of other studies examining the mental health of international migrants in other locations; migration as a social determinant of health was shown to lead to isolation and distress if there is a lack of social connection in a post-migratory setting.[16]

Several included studies found that living in Japan for short periods was a barrier to mental well-being while longer stays were facilitators. For example, Brazilians living in Japan for limited periods for work were found to have a higher prevalence of mental disorders.[75, 81, 85] In the assimilation theory of migration the length of residence in a host country and degree of proficiency in the host language are similarly thought to

positively influence the acculturation process as often within the first year of migration there are more mental disturbances due to culture shock and changes in daily life.[17] Similarly, a study by Tsuda and colleagues showed that Brazilians living in Japan for more than 5 years had fewer mental disorders.[78] Visa status or stability were not mentioned as a significant factor in mental well-being even among studies including subjects on a variety of visas although broader comparative studies may be warranted.

Contrastingly, studies by Qu *et al.* and Tsuji *et al.* found longer stays to be associated with worse well-being among different migrant populations.[32, 83] These findings support the cumulative disadvantage theory, which runs counter to the assimilation theory and suggests that health-related disadvantages, such as persistent transcultural distress, increase with prolonged length of residence in a receiving country.[77] While length of stay was often protective to migrant mental health in aggregate, similar to our results, a previous systematic reviews of migrant health also found such findings varied between included studies of migration in Canada.[18]

Discrimination has been previously studied as part of the migrant experience.[19] Similarly, it was noted to be a factor associated with poorer mental well-being in several studies of various types of migrants in this study.[35, 38, 46, 61] For example, researchers concluded that Chinese students are more likely to experience more episodes of discrimination or stigmatization from Japanese society the longer they live in Japan, negating chances for acculturation and negatively affecting their mental well-being. However, two studies of this population diverged as to whether the loss or maintenance of original Chinese cultural identity are facilitators of mental well-being but both maintain

Japanese culture does not accept them causing mental harm.[32, 33] Interestingly, Asakura and colleagues reasoned that Brazilians workers found better Japanese language skills to be associated with experiences of discrimination because workers with language skills could understand their status as an outsider more clearly.[46] Examination of discrimination among skilled workers versus unskilled workers in Japan has also shown similar findings.[20]

The female gender and religiosity were found to be a barrier and facilitators of mental well-being, respectively. There were 10 studies that found being female to be a barrier to mental well-being; only one study stated the female sex was a facilitator of mental well-being.[44] Previous migration studies have noted that female migrants experience significantly poorer mental well-being than the indigenous population.[21] Additionally, several studies on Filipino, Brazilian and Muslim migrants established religiosity as a strong facilitator of mental well-being.[47, 56, 58] Cultural identity and religiosity as facilitators of mental well-being are consistent with previous research on cultural identity and religious beliefs among migrants.[22]

Most of the studies surveyed in this review had general recommendations for the Japanese government, health authorities or society at large. As might be expected, the most discussed recommendation was the implementation of various support systems ranging from Japanese language education, medical systems and personal support networks. Such supports, like the provision of translated information and consultation desks, may address barriers for migrants; encouragingly local authorities have or are planning to implement many such mechanisms.[23] Notably absent from such government-backed systems,

however, is support for a comprehensive medical interpretation system for healthcare institutions.[24]

A more novel suggestion raised by fewer publications was the importance of transcultural education about diversity or appreciation of different cultural backgrounds. This due in part to generalization on the part of mass media and a general lack of awareness among the domestic population as the Japanese the word *imin*, immigrant, is generally only applied to low-skilled workers.[25] For example, representative studies called for a more positive characterization of migrants by the mass media while other authors stressed the importance of transcultural competence both in the workplace and medical centers by domestic staff.[33, 60] Such diversity education may address the structural barrier of discrimination, promoting inclusion and migrant health. It seems awareness of migration as a social determinant of health could be improved within the Japanese healthcare system and society at large.

Robust sampling in migration research is understood to be difficult because migrant populations are inherently mobile and often prefer to remain unidentified; thus, migrant research is chronically underfunded as research agencies are reluctant to award grants where rigorous methodology does not exist.[3] We found most studies on migrant mental well-being in Japan were community-based and used convenience or snowball sampling. Unsurprisingly, study populations were small, as half of studies enrolled less than 119 participants and only one publication included explicit sample size calculations.[79] The study with by far the largest sample size, utilized government survey records from Hamamatsu, Ibaraki Prefecture, to study the social connectedness of 1252 Brazilians

migrants.[80] There were also four retrospective surveys of medical records at isolated institutions over several years in our study.[42, 67, 69, 75] Taking into account the difficulty of sampling, samples were viewed as often justifiable to measure specific communities but representative cross-sections of entire migrant populations. In contrast, in their systematic review of issues for immigrant women in the perinatal period, Kita and colleagues surveyed more than ten studies with large samples sizes that reviewed Japanese medical or governmental records.[61] In order to increase the rigor of migrant health research in general, more analyses of health records and secondary analysis of government administered surveys are needed like the large-scale surveys regularly carried out in the European Union.[26]

Next, the representativeness of migrant sampling, in terms of proportionality to the actual foreign national community in Japan, was found to be skewed. According to the Ministry of Justice, the four most populous migrant nationalities as of 2018, in descending order, were Chinese (29%), Korean (18%), Vietnamese (10%) and Filipino (10%).[27] Contrastingly, the most populous migrant populations represented in our study were Brazilian (37%), Chinese (27%), Filipino (8%) and Korean (4%). It seems that Brazilian migrants and students, particularly Chinese students, have received more research attention in Japan. However, the Nepalese and Vietnamese populations in Japan have exploded in recent years but are not well-represented in the literature. Such disparities between the literature and reality were remarkable and may carry across migrant studies in Japan and should be addressed for accurate scoping of migrant health.[28]

Migrants to Japan are relatively understudied compared to migrant groups in other developed countries, especially in terms of mental health status. Japanese society, led by government, is at a critical juncture with new visa categories launched in April 2019 increasing the number of foreign workers dramatically.[29] Key health policy documents, such as the WHO Japan Health System Review, discuss health equity in depth but only mention migrant health in passing.[30] As it becomes clear that Japan perhaps needs international migrants perhaps more than the reverse, questions remain about whether Japanese society, led by government, is seriously prepared to facilitate positive mental well-being to create a flourishing society together with migrants regardless of nationality and socioeconomic status.

There are limitations to this systematic review that should be noted. Most of the studies reviewed were cross-sectional and therefore could only describe correlation and not causation so the strength of actionable conclusions may be impacted. As a narrative approach was taken to data synthesis, all studies were given an equal weight regardless of size, level of significance and quality. Heterogeneity testing or subgroup analysis of the surveyed literature were not done as part of a meta-analysis leaving the study qualitative in nature. Additionally, while this review aimed to analyze all published literature on the topic of migrant mental well-being in Japan, grey literature was not assessed. The strengths of this systematic review are its comprehensive nature in terms of search strategy and data analysis as well as examining publications published in Japanese. In this way readers can understand the scope of mental well-being as representative of general migrant studies in Japan.

Conclusion

The presence or absence of social support networks for migrants is the main determinant of mental well-being among foreign nationals living in Japan. While fostering of these networks is appropriate, the importance of promoting diversity awareness among healthcare professionals and society-at-large may be under-appreciated. Taken together, our results show that the mental well-being of migrants in Japan has been a marginal topic of international research in the 21st century with much of the literature published in Japanese and measuring disparate populations. This comprehensive analysis of the contemporary literature aims to promote migration studies as a serious research discipline in Japan leading to actionable government policy.

Footnotes

Author Contributions: Conception and design: RM, YT, KICO and MJ. Search strategy: RM and YT. Screening, extraction and quality assessment: RM and YT. Analysis and interpretation of data: RM, YT, KICO, AS and MJ. Drafting of the article: RM (all authors critically reviewed and approved manuscript).

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References

1. United Nations Educational, Scientific and Cultural Organization. Migrant/Migration [Internet]. [Updated 2016; cited 2018 Sept 1]. Available from: http://www.unesco.org/new/en/social-and-human-sciences/themes/international-migration/glossary/migrant/
2. Abubakar I, Aldridge RW, Devakumar D, et al. The UCL–Lancet Commission on Migration and Health: the health of a world on the move. Lancet 2018;**392**:2606-54.
3. Renzaho AM. *Globalisation, migration and health: Challenges and opportunities.* 1st ed. London: Imperial College Press. 2016.
4. Virupaksha HG, Kumar A, Nirmala BP. Migration and mental health: An interface. *J Natural Sci Bio Med* 2014;**5**:233. doi: 10.4103/0976-9668.136141
5. International Organization for Migration. World Migration Report 2018 [Internet]. [Updated 2018; cited 2018 Dec 3]. Available from: https://www.iom.int/wmr/world-migration-report-2018
6. Castañeda H, Holmes S, Madrigal D, et al. Immigration as a Social Determinant of Health. *Ann Rev Pub Health* 2015;**36**:375-392. doi:10.1146/annurev-publhealth-032013-182419
7. Salami B, Yaskina M, Hegadoren K, et al. Migration and social determinants of mental health: Results from the Canadian Health Measures Survey. *Can J Pub Health* 2017;**108**:e362-e367. doi:10.17269/cjph.108.6105

8. Ministry of Justice. Foreign National Residents by Nationality [Internet]. [Updated 2019; cited 2 February 2019]. Available from: http://www.stat.go.jp/english/data/nenkan/68nenkan/1431-02.html
9. Ministry of Internal Affairs and Communications, Statistics Bureau. Future Population (2016 to 2110) [XLS]. [Updated 2017; cited 2018 Dec 15]. Available from: http://www.stat.go.jp/english/data/jinsui/2.html
10. Parsons AJQ, Gilmour S. An evaluation of fertility- and migration-based policy responses to Japan's ageing population. *PLoS One* 2018;**13**:e0209285. doi:10.1371/journal.pone.0209285.
11. Eikemo TA, Bambra C, Huijts T, Fitzgerald R. The First Pan-European Sociological Health Inequalities Survey of the General Population: The European Social Survey Rotating Module on the Social Determinants of Health, *Euro Socio Rev* 2017;**33**:137–153.
12. Ministry of Justice. Analytical Report of the Foreign Residents Survey -Revised Edition-. [Updated 2017; Accessed 2018 Dec 25]. Available from: http://www.moj.go.jp/content/001249011.pdf.
13. Migration Integration Policy Index. Japan: Key Findings [Internet]. [Updated 2015; cited: 2019 Jan 1]. Available from: http://www.mipex.eu/japan
14. World Health Organization. Mental health: a state of well-being [Internet]. [Updated 2014, cited 2018 Sept 1]. Available from: http://who.int/features/factfiles/mental_health/en/

15. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med **6**(7): e1000097. doi:10.1371/journal.pmed1000097

16. Salinero-Fort MÁ, del Otero-Sanz L, Martín-Madrazo C, et al. The relationship between social support and self-reported health status in immigrants: an adjusted analysis in the Madrid Cross Sectional Study. *BMC Fam Pract* 2011;**12**:46.

17. Dhadda A, Greene G. 'The Healthy Migrant Effect' for Mental Health in England: Propensity-score Matched Analysis Using the EMPIRIC Survey. *J Immigr Minor Health* 2017;**20**:799-808. doi: 10.1007/s10903-017-0570-z

18. Vang Z, Sigouin J, Flenon A. The Healthy Immigrant Effect in Canada: A Systematic Review. *Population Change and Lifecourse Strategic Knowledge Cluster Discussion Paper Series/ Un Réseau stratégique de connaissances Changements de population et parcours de vie Document de travail* 2015;**3**:1-41.

19. Ibañez GE, Dillon F, Sanchez M, et al. Changes in Family Cohesion and Acculturative Stress among Recent Latino Immigrants. *J Ethn Cult Divers Soc Work* 2015;**24**:219-234. doi: 10.1080/15313204.2014.991979

20. Shun G. Are the Consequences of Experiencing Discrimination the same for Immigrants of Differing Socio-Economic Status In Japan? *Int Migr* 2017;**56**. doi: 10.1111/imig.12370

21. Depressive symptoms among migrants and non-migrants in Europe: documenting and explaining inequalities in times of socio-economic instability. *Eur J Public Health* 2018;**1**:54-60. doi:10.1093/eurpub/cky202.

22. Bhugra D, Becker MA. Migration, cultural bereavement and cultural identity. *World Psych* 2005;**4**:18-24.

23. Japan approves 126 measures to attract more foreign workers. Nikkei Asian Review. 2018 Dec 25. https://asia.nikkei.com/Spotlight/Japan-Immigration/Japan-approves-126-measures-to-attract-more-foreign-workers

24. Hamai T, Nagata A, Nishikawa H. The need for medical interpreters: a questionnaire survey of municipal hospitals in Japan [in Japanese]. *Jpn J Pub Health* 2017;**64**(11):672-83. doi: 10.11236/jph.64.11_672

25. Leppold C, Ozaki A, Shimada Y, Morita T, Tanimoto T. Defining and Acting on Global Health: The Case of Japan and the Refugee Crisis. *Int J Health Policy Manag* 2016;**5**(8):457-460. doi:10.15171/ijhpm.2016.68

26. European Union. Migrant Health Across Europe. By the Migrant Policy group [Internet]. [updated: 2018 Dec 2; cited 2018 Dec 15]. https://ec.europa.eu/migrant-integration/feature/migrant-health-across-europe

27. Ministry of Justice. Statistics on the Foreigners Registered in Japan. [Updated 2017; cited 2018 Nov 24]. Available from: www.ipss.go.jp/p-info/eps2017/PSJ2017-10.xls

28. Bhopal R, Rafnsson S. Global inequalities in assessment of migrant and ethnic variations in health. *Pub Health* 2012;**126**:241-244. doi: 10.1016/j.puhe.2011.11.016

29. Nikkei Asian Review. Japan enacts divisive foreign worker bill to ease labor shortage. 2018 Dec 8. https://asia.nikkei.com/Spotlight/Japan-Immigration/Japan-enacts-divisive-foreign-worker-bill-to-ease-labor-shortage
30. World Health Organization. Japan: Health System Review [Internet]. [Updated 2018; cited 2018 Nov 25]. Available from: http://apps.who.int/iris/bitstream/handle/10665/259941/9789290226260-eng.pdf;jsessionid=5E8D4C6125118E613132CA81B02306D7?sequence=1
31. Kakefuda A. A study into mental health of Japanese-Brazilian students [in Japanese]. J *Psyche, Cult* 2004;**3**:67-72.
32. Qu X, Li L. Attachment, Acculturation and GHQ-30 of Chinese Students in Japan. *Psychol Stud* 2013 **59**:145-150. doi:10.1007/s12646-013-0192-z
33. Sun Y. Chinese students in Japan: The mediator and the moderator between their personality and mental health. *Int J Psychol* 2013;**48**:215-223. doi:10.1080/00207594.2011.648942
34. Eskanadrieh S, Liu Y, Yamashina H, et al. Depressive symptoms among international university students in northern Japan: Prevalence and associated factors [in Japanese]. *Int Health* 2012;**27**:165-170.
35. Murphy-Shigematsu S. Psychological barriers for international students in Japan. *Int J Adv Couns* 2002;**24**:19-30. doi:10.1023/A:1015076202649
36. Guo Y, Li Y, Ito N. Exploring the Predicted Effect of Social Networking Site Use on Perceived Social Capital and Psychological Well-Being of Chinese International

Students in Japan. *Cyberpsychol, Behav Soc Net* 2013;**1**:1-7. doi:10.1089/cyber.2012.0537

37. Ozeki N, Knowles A, Ushijima H, Asada Y. Analysis of transcultural stress factors and the mental well-being of foreign Chinese-speaking students in Aomori. *J Aomori U. Health Welf* 2006;**7**(1):8-16.

38. Zheng G, Jimba M, Wakai S. Exploratory Study on Psychosocial Impact of the Severe Acute Respiratory Syndrome (SARS) Outbreak on Chinese Students Living in Japan. *Asia Pac J Pub Health* 2005;**17**(2):124-129.

39. Kono K, Eskandarieh S, Obayashi Y, Arai A, Tamashiro H. Mental Health and Its Associated Variables Among International Students at a Japanese University: With Special Reference to Their Financial Status. *J Immigr Minor Health* 2014;**17**(6):1654-1659. doi:10.1007/s10903-014-0100-1

40. Ma B. The relationship between mental health status and psychosociological factors among Chinese postgraduate students in Japan [in Japanese]. *Juntendo Med J*.2007;**53**:200-210.

41. Matsuda T, Tsuda A, Deng K. Relationship between Stage of Change for Stress Management Behavior and Mental Health among Chinese International Students in Japan. *Kurume U Psychol Res* 2013;**12**:44-49.

42. Hori T, Tachikawa H, Ishi T, et al. An Analysis of Mental Disorders of International Students Visiting the Mental Health Service at Tsukuba University Health Center. [in Japanese]. *Psych Neuro Jpn* 2012;**114**:3-12.

43. Wang F, Kyoko Y. Chinese self-sponsored overseas students' change tendency in mental health and relevant reasons [in Japanese]. *Psychol Rep Sophia U* 2009;**33**:109-125.

44. Mizuno H, Toshinori I. Relation of Sociological and Psychological Factors to Preferences Among Professional Helpers by Asian International Students in Japan [Japanese]. *Japanese J Educ Psychol* 2000;**48**:165-173.

45. Lee G. Job stress and mental health among high-skilled foreign workers (HFWs) in Japan: Comparative analysis between HFWs and Japanese workers [in Japanese]. *Stress Sci Res* 2015;**30**:90-101.

46. Asakura T, Gee GC, Nakayama K, Niwa S. Returning to the "Homeland": Work-Related Ethnic Discrimination and the Health of Japanese Brazilians In Japan. *Am J Public Health* 2008;**98**:743-750. doi:10.2105/AJPH.2007.117309

47. Onishi A, Murphy-Shigematsu S. Identity narratives of Muslim foreign workers in Japan. *J Community Appl Soc Psychol* 2003;**13**:224-239. doi:10.1002/casp.715

48. Ohara-Hirano Y. Cognitive Life Strains and Family Relationships of Filipino Migrant Workers in Japan. *Asian Pacific Migr J* 2000;**9**:365-374.

49. Date Y, Abe Y, Aoyagi K, et al. Depressive Symptoms in Chinese Factory Workers in Nagasaki, Japan. *Ind Health* 2009;**47**:376-382. doi:10.2486/indhealth.47.376

50. Ohara-Hirano Y. The Implication of Socio-economic Strain in Depression of Overseas Filipino Workers [in Japanese]. *Jpn Bulli Soc Psychiat* 2005;**14**:134-145.

51. Cho Y. Suicide prevention for foreign workers and trainees [in Japanese]. *Jpn J of Occup Ment Health* 2005;**13**(1):4-15.

52. Ohara-Hirano Y. The Mental Health Status of Indonesian Candidates Leaving for Japan under the Japan – Indonesia Economic Partnership Agreement : After the Great East Japan. *Int J Jpn Sociol* 2012;**21**:37-45. doi:10.1111/j.1475-6781.2012.01163.x

53. Nugraha S, Ohara-Hirano Y. The Mental Health Predictors of Indonesian EPA Nurses and Certified Care Worker Candidates in Japan 1. *Jpn Psychol Res* 2018;**58**:85-96. doi:10.1111/jpr.12100

54. Sato F, Hayakawa K, Kamide K. Investigation of mental health in Indonesian health workers immigrating to Japan under the Economic Partnership Agreement. *Nurs Health Sci* 2016;**18**:342-349. doi:10.1111/nhs.12275

55. Yamamoto T, Mizukami K. Occupational Stress among Nurses Working in Japan Through the Economic Partnership Agreement (EPA) [in Japanese]. *J Gen Fam Med* 2018;**41**(2):38-44.

56. Paillard-Borg S, Hallberg D. The Other Side of the Mirror : An Analytic Journalistic Approach to the Subjective Well-Being of Filipino Women Migrant Workers in Japan. *SAGE Open* 2018;**8**(1):0-10. doi:10.1177/2158244018757288

57. Shah R, Kiriya J, Shibanuma A, Jimba M. Use of modern contraceptive methods and its association with QOL among Nepalese female migrants living in Japan. *PLoS One* 2018;**13**:e0197243. doi:10.1371/journal.pone.0197243

58. Martinez M, Hatashita H, Suzuki H, et al. Socio-cultural Factors Affecting the Health of Pregnant and Puerperal Brazilian Women in Japan [in Japanese]. *J Int Heal* 2017;**32**:69-81.

59. Kawasaki C. Birth and Child-rearing Experiences of Immigrant Women in Japan and Their Support Needs: A Literature Review [in Japanese]. *Jpn Community Health Nurs* 2014;**16**:90-97.

60. Jin Q, Mori E, Sakajo A. Risk factors, cross-cultural stressors and postpartum depression among immigrant Chinese women in. *Int J Nurs Pract* 2016;**22**:38-47. doi:10.1111/ijn.12438

61. Kita S, Minatani M, Hikita N, Matsuzaki M, Shirashi M, Haruna M. A Systematic Review of the Physical, Mental, Social, and Economic Problems of Immigrant Women in the Perinatal Period in Japan. *J Immigr Minor Health* 2015;**17**:1863-1881. doi:10.1007/s10903-015-0192-2

62. Imai S, Kita S, Tobe H, Watanabe M, Nishizono-Maher A, Kamibeppu K. Postpartum depressive symptoms and their association with social support among foreign mothers in Japan at 3 to 4 months postpartum. *Int J Nurs Pract* 2017;**23**:1-9. doi:10.1111/ijn.12570

63. Bunketsu Y, Emori Y. Parenting stress of Chinese mothers living in Japan. [in Japanese]. *J Gen Fam Med* 2010;**33**:101-109.

64. Shimizu Y. Korean, Chinese, Brazilian mothers' child rearing stress in Japan. [in Japanese]. *Jpn J Matern Health* 2002;**43**:530-540.

65. Fujiwara Y, Horiuchi S. Immigrant women giving birth in Japan: Experience of loneliness and isolation [in Japanese]. *J Hum Care Stud* 2007;**8**:38-50.

66. Shakya P, Tanaka M, Shibanuma A, et al. Nepalese migrants in Japan : What is holding them back in getting access to healthcare ? *PLoS One* 2018;**13**:e0203645.

67. Koyama A, Okumi H, Matsuoka H, et al. The physical and psychological problems of immigrants to Japan who require psychosomatic care: A retrospective observational study. *Biopsychosoc Med* 2016;**10**:35-37. doi:10.1186/s13030-016-0052-x

68. Moon J, Mikami H. Difference in subjective well-being between ethnic Korean and Japanese elderly residents in an urban community in Japan. *Geriatr Gerontol Int* 2007;**7**:371-379. doi:10.1111/j.1447-0594.2007.00427.x

69. Koyama A, Niki M, Matsuoka H, et al. Psychological Problems for Non-Japanese Speaking Patients in Japan. *J Travel Med* 2012;**19**:324-326. doi:10.1111/j.1708-8305.2012.00645.x

70. Ichikawa M, Nakahara S, Wakai S. Effect of Post-Migration Detention on Mental Health Among Afghan Asylum Seekers in Japan. *Aust New Zeal J Psychiatry* 2006;**40**:341-346. doi:10.1080/j.1440-1614.2006.01800.x

71. Itoi Y. Acculturative Stress Among Cambodian Living in Japan [in Japanese]. *Jpn J Hum Sci Health-Soc Serv* 2007;**35**:51-58.

72. Fukaya H. Acculturative stress and depression among foreigners in Japan [in Japanese]. *Jpn Bull Soc Psychiat* 2002;**11**:11-19.

73. Ohara-Hirano Y. Study on Depression Experienced by Foreign Residents in Kyushu Area [in Japanese]. *Mem Kyushu U Sch Heal Sci* 2001;**28**:129-137. doi:10.15017/305

74. Lee CH, Min SK, Jeon WT, Kigawa M, Sugawara M. Mental health and quality of life of North Korean defectors living in Japan. *Asian J Psychiatr* 2009;**2**:95-99. doi:10.1016/j.ajp.2009.07.001

75. Miyasaka LS, Canasiro S, Abe Y, et al. Migration and mental health: Japanese Brazilians in Japan and in Brazil. *J Bras Psiquiatr* 2007;**56**:48-52.

76. Kondo S, Otsuka K, Sawaguchi GT, et al. Mental health status of Japanese-Brazilian children in Japan and Brazil. *Psychiatry Clin Neurosci* 2011;**65**:226-232. doi:10.1111/j.1440-1819.2011.02202.x

77. Asakura T, Murata AK. Demography, Immigration Background, Difficulties with Living in Japan , and Psychological Distress among Japanese Brazilians in Japan. *J Immigr Heal* 2006;**8**:325-338. doi:10.1007/s10903-006-9003-0

78. Tsuji K, Miyasaka LS, Otsuka K, Honda G, Kato S, Abe Y. Panic disorder cases in Japanese-Brazilians in Japan : Their ethnic and cultural confusion. *Psychiatry Clin Neurosci* 2001;**55**:127-130.

79. Miyasaka LS, Otsuka K, Tsuji K, et al. Mental health of two communities of Japanese- Brazilians : A comparative study in Japan and in Brazil. *Psychiatry Clin Neurosci* 2002;**56**:55-64.

80. Takenoshita H. Social Capital and Mental Health among Brazilian Immigrants in Japan. *Int J Japanese Sociol* 2015;**24**(1):48-64. doi:10.1111/ijjs.12036

81. Honda G, Otuka K, Kuniaki Y, Tsuji K, Abe Y. Psycho-social risk factors for mental disorder among Japanese-Brazilian in Japan [in Japanese]. *Jpn Bull Soc Psychiat* 2005;**14**:45-54.

82. Tsuji K, Miyasaka L, Otsuka K. Depression among immigrants to Japan - A mental health survey of Japanese-Brazilians [in Japanese]. *Jpn Bull Soc Psychiat* 2000;**9**(2):163-170.

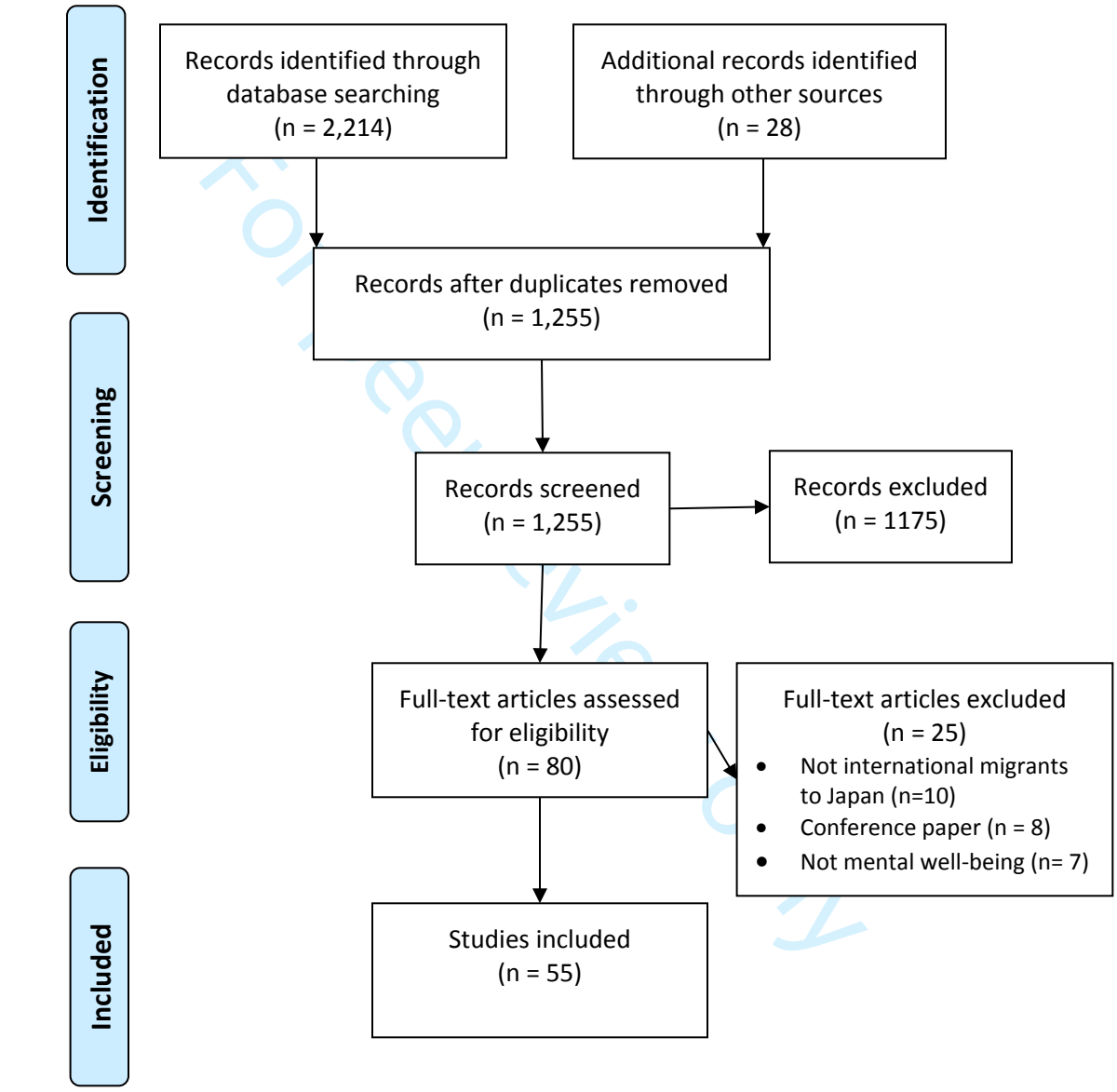
83. Tsuji K, Miyasaka L, Otsuka K, et al. Influence of relationship between duration of residence in Japan and degree of adaptation on the mental health status of Japanese-Brazilian immigrants [in Japanese]. *Jpn Bull Soc Psychiat.* 2002;**10**(3):253-260.

84. Asakura T. The Association between Acculturation to Japan Life and Psycho-Somatic Distress among Japanese-Brazilian Students [in Japanese]. *Jpn J Sch Heal*. 2005;**46**(1):628-647.

85. Otsuka K, Miyasaka L, Honda G, Yamaga K, Kato S, Nakamura Y. Cultural adaptation and mental health among Brazilians of Japanese descent living in Japan [in Japanese]. *Jpn Bull Soc Psychiat.* 2001;**10**:149-158.

PRISMA 2009 Flow Diagram

Figure 1. Flow chart of screening process



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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Supplementary Table 1. Study Quality Assessment

Citation	Pre-migration	Post-migration	Non-migrant comparison	Valid measurement	Justification of sample size	Study Quality
Students						
Kakefuda, 2004 * [31]		X		X	X	3
Qu, 2013 [32]		X		X	X	3
Sun, 2013 [33]		X		X	X	3
Eskanadrieh, 2012 * [34]		X		X	X	3
Murphy-Shigematsu, 2002 [35]	X	X			X	3
Guo, 2013 [36]		X		X	X	3
Ozeki, 2006 [37]	X	X		X	X	4
Zheng, 2005 [38]		X		X	X	3
Kono, 2014 [39]		X		X	X	3
Ma, 2007 * [40]		X		X	X	3
Matsuda, 2013 * [41]		X		X	X	3
Hori, 2012 * [42]		X	X	X	X	4
Wang, 2009 * [43]		X		X		2
Mizuno, 2000 * [44]		X		X	X	3
Workers						
Lee, 2015 * [45]	X	X	X	X	X	5
Asakura, 2008 [46]		X		X	X	3
Onishi, 2003 [47]	X	X			X	3
Ohara-Hirano, 2000 [48]		X		X	X	3
Date, 2009 [49]		X		X	X	3
Ohara-Hirano, 2005 * [50]	X	X		X	X	4
Cho, 2005 * [51]		X		X	X	3
EPA Care Workers						
Ohara-Hirano, 2012 [52]	X			X	X	3
Nugraha, 2016 [53]	X	X		X	X	4
Sato, 2016 [54]		X		X	X	3
Yamamoto, 2018 * [55]		X		X	X	3
Exclusively Women						
Paillard-Borg, 2018 [56]	X	X		X		3
Shah, 2018 [57]		X		X	X	4
Mothers						
Martinez, 2017 * [58]		X		X	X	3
Kawasaki, 2014 * [59]		X				1
Jin, 2016 [60]		X		X	X	3
Kita, 2015 [61]		X		X	X	3
Imai, 2017 [62]	X	X	X	X	X	5
Bunketsu, 2010 * [63]		X		X	X	3
Shimizu, 2002 * [64]		X	X	X	X	4
Fujiwara, 2007 * [65]		X		X		2
General Migrant Population						
Shakya, 2018 [66]	X	X		X	X	4
Koyama, 2016 [67]		X		X	X	3
Moon, 2007 [68]		X	X	X	X	4
Koyama, 2012 [69]		X		X		2
Ichikawa, 2006 [70]	X	X		X	X	4
Itoi, 2007 * [71]	X	X		X	X	4
Fukaya, 2002 * [72]		X		X	X	3
Ohara-Hirano, 2001 * [73]	X	X			X	3
Lee, 2009 [74]		X	X	X	X	4
Brazillian 'Nikkeijin'						
Miyasaka, 2007 [75]		X	X	X	X	4
Kondo, 2011 [76]	X	X	X	X	X	4
Asakura, 2006 [77]		X		X	X	3
Tsuji, 2001 [78]	X	X			X	3
Miyasaka, 2002 [79]	X	X	X	X	X	5
Takenoshita, 2015 [80]		X		X	X	3
Honda, 2005 * [81]	X	X		X	X	4
Tsuji, 2000 * [82]		X		X	X	3

Tsuji, 2002 * [83]		X		X	X	3
Asakura, 2005 * [84]	X	X		X	X	4
Otsuka, 2001 * [85]		X		X	X	3

Table 2. Extracted Data
*denotes Japanese publication

		Study Characteristics						Factors for Well-being		
Full Study Title	**Study Abbreviation**	**Study Design**	**Study Area**	**Migrant Nationality**	**Number**	**Mental Health Variable**	**Epi Tool**	**Barrier**	**Facilitator**	**Policy recommendation related to international migrants**
Students										
A study into mental health	Kakefuda, 2004 * [31]	Cross-sectional, Qualitative	Honshu	Brazilian	66	Adaptation Mental well-being	Questionnaire Interview	Low Japanese language skills, Low support from teachers or parents, Problems with studying	Good communication with Japanese or other Nikkei Brazilians, Having a plan for after graduation or future	Creation of a mental health care system for foreign students.
Attachment, Acculturation	Qu, 2013 [32]	Cross-sectional	Tokyo	Chinese	194	Mental well-being	ECRS GHQ VIA	Attachment Anxiety, Attachment Avoidance, Length of Stay beyond one year	Cultural Identity	Improve intercultural communication between Asian countries to facilitate clinical interventions and prevention programs.
Chinese students in Japan	Sun, 2013 [33]	Cross-sectional	Tokyo	Chinese	253	Psychological distress	Questionnaire GHQ-30 AAS TCI	Marginalization (loss of original culture but do identify with new one; a poor acculturation strategy), Harm Avoidance	Social support, Self-directedness	Foster a positive outlook between Japanese culture and Chinese culture; Mass media from both countries should aim to promote mutual understanding and acceptance.
Depressive symptoms am	Eskanadrieh, 2012 [34]	Cross-sectional	Sapporo	Chinese (40%) other Asians (32%) South Koreans (14%) non-Asians (14%)	480	Depressive symptoms	Questionnaire CES-D	Female, Masters degree student, Arts students, Self supporting, Living alone	None	Examination of the mental health condition of international students; Japan requires more conclusive evidence for the seriousness of mental health and should take appropriate action.
Psychological barriers for	Murphy-Shigematsu, 2002 [35]	Qualitative	Nonspecific Japan	Unspecified Various	15	Psychological barriers	Counseling Sessions	Unrealistic post-migration expectations, Discrimination, Cross-cultural communication	Coping strategies, Support-seeking, Refocusing of goals	Multicultural training for university staff; Support systems for international students such as pre-departure and post-arrival orientations.
Exploring the Predicted E	Guo, 2013 [36]	Cross-sectional	Sapporo	Chinese	142	Social capital Mental well-being	Questionnaire ISCS SWLS ASSIS	Dependence on SNS for entertainment, Acculturative stress	Use of SNS for information seeking, Social capital	Further studies on SNS use and acculturation.
Analysis of transcultural s	Ozeki, 2006 [37]	Cross-sectional	Aomori City	Chinese-speaking (39) English-speaking (32)	71	Transcultural stress	Questionnaire GHQ30	Finances, Being a Chinese-Speaker	Being an English-speaker	Provide support for Chinese speakers in terms information in native language and adapting to daily life in Japan.
Exploratory Study on Psy	Zheng, 2005 [38]	Cross-sectional	Tokyo	Chinese	161	Psychosocial impact	estionnaireOpen-ended questio	Studying medicine or social sciences; Migration from a SARS affected area of China	More than a year of residence; Below age 31	Social discrimination against students during disease outbreaks should be minimized; A safe environment should be fostered for their recovery.
Mental Health and Its Ass	Kono, 2014 [39]	Cross-sectional	Sapporo	Korean (59)Other Asian (139)?	480	Depressive symptoms	QuestionnaireCES-D	Lack of scholarship, Poor housing conditions	Sleep quality, Exercise	Authorities should make sure international students can support themselves and maintain their health.
The relationship between	Ma, 2007 * [40]	Cross-sectional	Kanto, Tohoku, Hokkaido	Chinese	267	Mental health status Psychosociological factors	Questionnaire GHQ SDS	Female, Feeling irritated daily, Uneasy characteristics, Low self-esteem	Emotional support network	Improve emotional support networks for international students; Further studies to compare student mental health status in Japan and China.
Relationship between Sta	Matsuda, 2013 [41]	Cross-sectional	Kyushu	Chinese	199	Stress management	QuestionnaireDHQ-28	Pre-contemplation and contemplation stage stress management	Maintenance stage stress management, Actively practicing stress management behavior	None
An Analysis of Mental Di	Hori, 2012 * [42]	Retrospective, Case series	Ibaraki	Asian (66%) Russian (10%) Europian (7%) Latin american and African (5%) mixed	59	Depression, Adjustment disorder, Insomnia, and Schiophrenia	Medical records (diagnosed using ICD-10)	Stresses related to studying, Inter-personal relationship problems, Cultural stress	None	Preparations for emergency consultations by non-Japanese at health centers.
Chinese self-sponsored ov	Wang, 2009 * [43]	Cohort study Qualitative	Tokyo, Ibaraki	Chinese	7	Mental stress	GHQ-30 Semi-structured interview	Weak personal relationships, Loneliness, Poor daily life management, Psychosomatic diseases	Comfortable lifestyle, Good relationship with others, Clear aim of studying abroad	Provide guidance for daily life management; Provide information about studying and future; Support the creation of communication networks.
Relation of Sociological a	Mizuno, 2000 * [44]	Cross-sectional	Kanto area, Tokai area, Chugoku area	Chinese (159) Korean (59) Taiwanese (46)	264	Mental support Help-seeking behavior	Questionnaire	Concerns about helper responsiveness, Living with spouse	Female, Experience with professional supports	Construct a more effective support system
Workers										

Job stress and mental hea	Lee, 2015 * [45]	Cross-sectional Comparative	Tokyo	Korean (66) Chinese (50) other Asian (8) non-Asian (2)	INTL (126) JP (150)	Job stress and mental health	Questionnaire	Overwork, Interpersonal relationship stress	None	A prevention-centered strategy is needed to address job stress.
Returning to the "Homela	Asakura, 2008 [46]	Cross-sectional	Northern Kanto	Braziian	313	Psychological symptoms	Questionnaire GHQ-12	Discrimination, Environmental hazards at work, Higher education (low-skill job mismatch), Higher Japanese level (can understand discrimination)	None	To improve the health of migrants: Establish policies and practies designed to decrease ethnic discrimination in the workplace; Improve education about diversity.
Identity Narratives of Mus	Onishi, 2003 [47]	Qualitative	Tokyo	Bangladeshi (13) Pakistani (7) Iranian (4)	24	Coping Strategies for Mental Welll-being	Narrative analysis of Interviews	Percieved low social status, Societal disregard of their socio-economic background, Prejudice	Adapting to and accepting Japanese language and culture, Keeping Muslim identity	Develop immigration policies that empower migrants as participants in society and potential Japanese citizens, not only to fill economic needs; Media should create more positive image of non-Japanese; Schools should develop cultural awareness and tolerance for diversity to foster a multi-cultural Japan.
Cognitive Life Strains and	Ohara-Hirano, 2000 [48]	Qualitative	Tokyo	Filipino	265	Stress	Categorization of Interview responses	Worry about sending money home, How family will use such money	Emotional support from family	It is important to consider how a migrant's cultural background informs their adjustment to living in Japan.
Depressive Symptoms in	Date, 2009 [49]	Cross-sectional	Nagasaki City	Chinese	81	Depressive Symptoms	Questionnaire CES-D	Longer working hours, Age over 30 years	None	Health authorities should consider working time and age as important indicators for reducing depressive symptos among foreign workers.
The Implication of Socio-	Ohara-Hirano, 2005 * [50]	Comparative Cross-sectional	Kanto	Filipino	in JPN (265) in KR (401)	Socio-economic strain, Depression	Questionnaire CES-D	Strain about family, Strain about future	None	Consider the background not only the host country but also the labor-exporting country to understand migrant mental health.
Suicide prevention for for	Cho, 2005 * [51]	Case series	Japan	Chinese (11) Indonesian (2) Vietnamese (1) Filipino (1)	15	Suicide	Secondary data (JITCO)	Male, Age greater than 30 years, Shorter stay in Japan (<8 months), Lack of communication	None	With rapid deterioration of mental conditions, the economic burden of foriegn workers and possible feelings of failures should be taken into account; Appropriate psychiatric treatment is then required.
EPA Care Workers										
The Mental Health Status	Ohara-Hirano, 2012 [52]	Cross-sectional	Indonesia	Indonesian	102	Mental Health Status	Questionnaire GHQ	Difficulty bringing family to Japan, Worry about national board examination	Strong motivations for working in Japan	More studies comparing Filipino and Indonesian EPA nurse mental health.
The Mental Health Predic	Nugraha, 2016 [53]	Cross-sectional	Japan	Indonesian	92	Mental Health Predictors	Questionnaire GHQ-12 MSPSS SCAS	Female, Feeling skills are underutilized, Fatigue	Social support, Job satisfaction, Sociocultural adaption, Confidence about passing the national board examination	Provide information to prospective care workers about working conditions in mother language to better prepare them physically and mentally for migration to Japan; Long-term follow-up studies are recommended.
Investigation of mental he	Sato, 2016 [54]	Cross-sectional	Japan	Indonesian	71	Mental Health Status	Questionnaire GHQ-28	Female, Having passed the national board certification	Language support, Informational support	Sharing experiences gained by health facilities that have accepted EPA nursing staff previously; Establishment of an ongoing support system aimed at workers who have completed the national qualifications.
Occupational Stress amor	Yamamoto, 2018 * [55]	Cross-sectional	Japan	Indonesian (38) Filipino (26) Vietnamese (8)	72	Stress	Questionnaire SOC	Qualitative burden, Physical burden, Confusion about workstyle differences between Japan and the participant's country, Degree of skill utilization, Job suitability	Adjustment to life in Japan, Understanding Japanese language, Satisfaction of work and life, High sense of coherence	Consideration of job burden and workplace environment to improve sense of coherence.
Exclusively Women										
The Other Side of the Mir	Paillard-Borg, 2018 [56]	Qualitative	Tokyo	Fillipino	3	Subjective Well-Being	Focus Group Interview	Japanese language, Isolation from family, Overwork	Religion, Connection with migrant community, Maternal Identity	Support for and education about the health of migrant women.
Use of modern contracept	Shah, 2018 [57]	Cross-sectional	Kanto Area	Nepalese	189	Quality Of Life	Questionnaire WHOQOL-BREF	Differences in medical culture, Unwanted pregnancy, Abortion	Health education	Reproductive health education for migrants.
Mothers										

Socio-cultural Factors Aff	Martinez, 2017 * [58]	Qualitative	Northern Kanto	Brazilian	18	Mental health	Semi-structured interviews	Pregnancy and child rearing, Anxiety about work and income, Complications due to being a foreigner, Absence of social support	Equal and deeply connected family, Strength to continue working, Choosing the right conditions to settle down in, Religiousity	Understand the socio-cultural factors affecting the health; Provide intervention that lead pregnant and perperal Brazilian women to have appropriate health behaviors.
Birth and Child-rearing E	Kawasaki, 2014 * [59]	Systematic Review	Japan	Various	Study: INTL (15) JP (18)	Mental health status support	Systematic Review	Cross-cultural conflict, Dilemma, Lack of support, Isolation, Loneliness	None	Immigrant women need access to information and social support services, and help in coping with difficulties as immigrants.
Risk factors, cross-cultura	Jin, 2016 [60]	Mixed-method	Kanto	Chinese	22	Depression Stress	Questionnaire EPDS SSS CCS	Unable to follow traditional birthing preparation, low socio-economic status	Social Support	Trascultural healthcare training in Japan, especially on Chinese birthing practices (Zuoyuezi and Yuezican) to reduce cross-cultural stress.
A Systematic Review of th	Kita, 2015 [61]	Systematic Review	Japan	Various	36 studies	Psychological Health	Systematic Review	Anxiety about birth in Japan, Lack of support, Social isolation, Language barrier, Lack of information, Racial discrimination, Limited access to health care, Low socio-economic status	Strengthening social-connectedness	Establishment of multilingual and culture-specific health services, strengthened social and support networks as well as support and political action.
Postpartum depressive sy	Imai, 2017 [62]	Cross-sectional Comparative	Japan	Chinese (29) Korean (8) Vietnamese (5) Fiipino (5) Mixed	INTL (68) JP (97)	Depressive Symptoms	Questionnaire EPDS SSPS-P	Lack of support from partner or family, Low socio-economic status	None	Medical staff to encourage support from family and provide information about prepatory maternal services
Parenting stress of Chines	You, 2010 * [63]	Cross-sectional	Kanto	Chinese	132	Child-rearing stress	Questionnaire	Time limited due to childcare, Worry about their children after return to China, Difficulties in maintaining work and family balance, Loneliness	Talking with Chinese friends, Making efforts to change their moode or perception, Patience	For prompt and effective harmonazation with Japanese society, Provide Childcare support with easy-to-use child care facilities, Chance of studing Japanese, Well-baby clinic conducted in Chinese
Korean, Chinese, Brazilia	Shimizu, 2002 * [64]	Cross-sectional Comparative	Kanto, Chubu area	Brazilian (111) Chinese (70) Korean (29)	INTL (210) JP (625)	Parenting stress	Questionnaire	Difficulties with work and child rearing balance, Worry about child characteristics or language ability, Inadequacy of child care environment	Ask help for others	Establish a place to relieve stress speaking native language
Immigrant women giving	Fujiwara, 2007 * [65]	Qualitative	Tokyo	Asian Europian Middle Eastern	9	Loneliness Isolation	Semi-structured interviews	Difficulties in verbal communication, Confusion with Japanese medical culture, Less support	Positive attitude by midwife towards interaction	Provide enough time for caring. Set-up translators or multi-language brochure
General Migrant Populations										
Nepalese migrants in Japa	Shakya, 2018 [66]	Cross-sectional	Central Japan	Nepalese	642	Mental Health Status	Questionnaire MSPSS PSS CES-D SCL-90-R	Needing a interpreter during visit to Japanese healthcare facility	Paying health insurance regularly, Satisfaction, self-rated health, longer stay in Japan	Interventions focusing on reduction of language barrier between migrants and health workers.
The physical and psychole	Koyama, 2016 [67]	Case Series	Osaka	American (5) Chinese (5) Australian (2) Taiwanese (2) Various	20	Mental Halth Consulation	Medical Records	Cultural differences, Japanese language barriers to describe symptoms	None	Sensitization of health care professionals to transcultural care by facilitating medical professional interpreters and liaison-consulation models. Government should introduce comprehensive social support of non-Japanese people.
Difference in subjective w	Moon, 2007 [68]	Cross-sectional Comparative	Osaka	Korean (204)	KR (204) JP (221)	Subjective well-being	Questionnaire CGA TMIG-IC GDS-15	Korean ethnicity, Absence of sense of purpose of life	None	More pro-active ethnicity-specific support from existing community organiztions and authorities.
Psychologial Problem for	Koyama, 2012 [69]	Case Series	Osaka	American (2) Australia (1) New Zealand (1) England (1)	5	Mental Health Consultation	Medical Records SDS STAI	Cultural differences, Japanese language barriers to describe symptoms, Unemployment	None	Promotion of transcultural medical interpreters for psychosomatic medicine and comprehensive social support system for non-Japanese by government.
Effect of post-migration d	Ichikawa, 2006 [70]	Cross-sectional	Tokyo Osaka	Afghan	55	Anxiety Depression Posttraumatic Stress	Questionnaire HSCL-25 HTQ	Detention by immigration authorities, Premigration trauma exposure, Living alone	None	Reconsideration of tightening of immigration policies in terms of both health and human rights.

Acculturative Stress Amo	Itoi, 2007 * [71]	Cross-sectional	Kanto	Cambodian	49	Acculturative stress	Questionnaire modified LASC-I	Female, Less education, Fewer Japanese language skills, Shorter length of staying in Japan, Lower occupational status	None	Improve the education systems, Japanese language education, an employment systems, develop a program to promote an education for the people in the host country
Acculturative stress and d	Fukaya, 2002 * [72]	Cross-sectional	Kanagawa prefecture	Filipino (43) Nikkei-Brazilian (38) Various	110	Acculturative stress Depressive symptoms	LASC-I CES-D ISEL-S	Less education, Shorter length of stay, Lower social support	Social support	Increase social support for foreign residents.
Study on Depression Exp	Ohara-Hirano, 2001 * [73]	Cross-sectional	Kyushu	Filipino (36%) Peruvian (9.4%) Chinese (9.4%) Indonesian (9.0%) Various	280	Depressive symptoms	Questionnaire CES-D	Non-western national origin, Migration to Japan for work or training	Non-western national origin, Migration to Japan for marriage, Live with family	Japanese society needs to set up support systems for finding jobs, improving daily life, and so on.
Mental health and quality	Lee, 2009 [74]	Cross-sectional Comparative	Japan	North Korean defector	in JP (30) in KR (51) JP (43)	Mental health and Quality of Life	BDI WHOQOL-Bref Semi-Structured Interview	Language fluency, Adopted nationality	Longer length of stay	Better monitoring of pervasive depression among refugees; Consideration of social support system and effective medical interventions for proper adjustment to Japan.
Brazillian 'Nikkeijin'										
Migration and mental hea	Miyasaka, 2007 [75]	Cross-sectional Comparative	Northern Kanto Sao Paulo	Braziian	in BRZ (100) in JP (107)	Mental Health Disorders	Medical Records	Living alone, Staying in Japan for short periods	Living with family, Having network of friends	Mental heath professionals should encourage building a network of friends and support systems.
Mental health status of Ja	Kondo, 2011 [76]	Cross-sectional Comparative	Northern Kanto Sao Paulo	Brazilan	in BRZ (331) in JP (172)	Mental Health Status	SDQ	Adverse circumstances at home and at school while living in Japan	None	Further verification studies.
Demography, Immigratio	Asakura, 2006 [77]	Cross-sectional	Northern Kanto	Brazilian	265	Psychological disturbance	Questionnaire GHQ-12	Living alone, Longer stay in Japan, Lower economic status, Migration to Japan due to unsatisfactory socio-economic conditions in Brazil, Severe family life concerns	Moderate Japanese Language profiency, Plans to return to Brazil as soon as possible	Provision of more information about Japan life, culture and working conditions prior to migration to form more accuate expectations and help with adjustment through consultation services; Government policy outlining treatment of foriegn workers to stop discrimination and promote equal treatment; Change societal mindset to one of embracing diversity; Opportunites for advancement and job training. NGO and government support services for foreign workers will promote health and assimilation.
Panic disorder cases in Ja	Tsuji, 2001 [78]	Cross-sectional	Northern Kanto	Brazilian	40	Mental Health Disorders	Medical Records	More distant descendant of Japanese	Japanese language ability, Length of stay beyond 5 years	Further studies on mental health of Brazilians.
Mental health of two com	Miyasaka, 2002 [79]	Cross-sectional Comparative	Northern Kanto	Brazlian	in BRZ (213) in JP (158)	Mental Health Status	Questionnaire SRQ-20	Being female, Being a smoker, Previously being a student in Brazil	None	Authors established a mental health network for Brazilians in Japanese migrant population centers that is proving useful.
Social Capital and Mental	Takenoshita, 2015 [80]	Cross-sectional	Northern Kanto	Brazilian	1252	Psychological Well-Being	Secondary Data Questionnaire CES-D	Being Female, Unemployed, Percieved descrimination	Bonding social capital (relatives live nearby nearby)	None
Psycho-social risk factors	Honda, 2005 * [81]	Cross-sectional	Kanto	Brazilian	150	Mental Illness, Risk Factors	Questionnaire SRQ-20	Living alone, Shorter periods of stay (< 5 years), Previous psychiatric problems, Lower Japanese ability, Culture conflict betweeen Japan and Brazil	None	None
Depression among immig	Tsuji, 2000 * [82]	Cross-sectional Comparative	Tochigi Bauru (Brazil)	Brazilian	BRZ (213) JP (157)	Depression	Questionnaire SRQ-20	Female, Under 30 years old, Being a student prior to immigration	None	None
Influence of relationship b	Tsuji, 2002 * [83]	Cross-sectional	Tochigi	Brazilian	151	Depression	Questionnaire SRQ-20	Current findings: Not significant; Findings 2 years previous with same indicators: Female, Youth, Student prior to immigration	Longer staying in Japan (>2 years)	None

The Association between	Asakura, 2005 * [84]	Cross-sectional	Aichi	Brazilian	112	Psychosomatic distress	Questionnaire	Less time spent with parents, Difficulties in adaptatinng to Japanese customs and social environment, Higher frequency being not understood by parents, Poorer adaption to school	Good relationships with Japanese firends, Good family relationships, More social support, Longer staying in Japan	Health promotion for ethnic minority students.
Cultural adaptation and m	Otsuka, 2001 * [85]	Cross-sectional	Tochigi	Brazilian	163	Aculturation, Mental Disorders	Questionnaire	Living alone, Poor aculturation, Isolation from society, Low Japanese language skills, Shorter length of stay	cultural identity	None

Supplementary Table 2. Epidemological Tool Abbreviations

AAS	Acculturation Attitude Scale
ASSIS	Acculturative Stress Scale for International Students
BDI	Beck Depression Inventory
CCS	Cross-Cultural Stress Scale
CES-D	Center for Epidemiologic Studies Depression
CGA	Comprehensive Geriatric Assessment
ECRS	Experiences in Close Relationship Scale
EPDS	Edinburgh Postnatal Depression Scale
GDS-15	Geriatric Depression Scale
GHQ-30	General Health Questionnaire 30
HSCL-26	Hopkins Symptoms Checklist 25
HTQ	Harvard Trauma Questionnaire
ISCS	Internet Social Capital Scale
ISEL-S	Interpersonal Support Evaluation List Scale
LASC-I	Latin American Stress and Acculturative Stress and Coping Inventory
Medical Records	Retrospectively analyzed patient mental health records
MSPSS	Multidimensional Scale of Perceived Social Support
PSS	Perceived Stress Scale
SCAS	Sociocultural Adaptation Scale
SCL-90-R	Symptoms Checklist-90-Revised
SDQ	Strength and Difficulties Questionnaire
SDS	Self-rating Depression Scale
SOC	Sense Of Coherence
SRQ-20	Self-reporting Questionnaire
SSPS-P	Social Support Perception Scale for Parents Rearing Preschoolers
SSS	Social Support Scale
STAI	State-Trait Anxiety Inventory
SWLS	Satisfaction with Life Scale
TCI	Temperament and Character Inventory
TMIG-IC	Tokyo Metropolitan Institute of Gerontology Index of Competence
VIA	Vancouver Index of Acculturation
WHOQOL-BREF	World Health Organization Quality of Life- Brief Version

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Systematic review

1. * Review title.

Give the working title of the review, for example the one used for obtaining funding. Ideally the title should state succinctly the interventions or exposures being reviewed and the associated health or social problems. Where appropriate, the title should use the PI(E)COS structure to contain information on the Participants, Intervention (or Exposure) and Comparison groups, the Outcomes to be measured and Study designs to be included.

Mental Well-being of International Migrants to Japan: a Systematic Review

2. Original language title.

For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

3. * Anticipated or actual start date.

Give the date when the systematic review commenced, or is expected to commence.

30/08/2018

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

31/01/2019

5. * Stage of review at time of this submission.

Indicate the stage of progress of the review by ticking the relevant Started and Completed boxes. Additional information may be added in the free text box provided.
Please note: Reviews that have progressed beyond the point of completing data extraction at the time of initial registration are not eligible for inclusion in PROSPERO. Should evidence of incorrect status and/or completion date being supplied at the time of submission come to light, the content of the PROSPERO record will be removed leaving only the title and named contact details and a statement that inaccuracies in the stage of the review date had been identified.
This field should be updated when any amendments are made to a published record and on completion and publication of the review. If this field was pre-populated from the initial screening questions then you are not able to edit it until the record is published.

The review has not yet started: No

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Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

Provide any other relevant information about the stage of the review here (e.g. Funded proposal, protocol not yet finalised).

Journal Submission

Journal Submission

6. * Named contact.

The named contact acts as the guarantor for the accuracy of the information presented in the register record.

Russell Miller

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Mr. Miller

7. * Named contact email.

Give the electronic mail address of the named contact.

rmiller01@m.u-tokyo.ac.jp

8. Named contact address

Give the full postal address for the named contact.

113-0034 Tokyo, Bunkyo Yushima 3-12-8, Wellcasa Bunkyo Yushima #1001

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

+8108033499979

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

The University of Tokyo, Department of Community and Global Health

Organisation web address:

http://www.ich.m.u-tokyo.ac.jp/en/index.html

11. * Review team members and their organisational affiliations.

Give the title, first name, last name and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong.

Mr Russell Miller. University of Tokyo
Ms Yuri Tomita. University of Tokyo
Assistant/Associate Professor Ken Ing Cherng Ong. University of Tokyo
Assistant/Associate Professor Akira Shibanuma. University of Tokyo
Professor Masamine Jimba. University of Tokyo

12. * Funding sources/sponsors.

Give details of the individuals, organizations, groups or other legal entities who take responsibility for initiating, managing, sponsoring and/or financing the review. Include any unique identification numbers assigned to the review by the individuals or bodies listed.

None

13. * Conflicts of interest.

List any conditions that could lead to actual or perceived undue influence on judgements concerning the main topic investigated in the review.

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members.

15. * Review question.

State the question(s) to be addressed by the review, clearly and precisely. Review questions may be specific or broad. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS where relevant.

Objective 1: What are the factors (barriers and facilitators) of mental well-being for migrants in a Japanese context?

Objective 2: Are there any specific differences in mental well-being among migrant status (e.g. low-skilled migrants, highly-skilled immigrants, international students, asylum seekers) or nationality?

Objective 3: Are there areas of improvement that can be addressed by Japanese society?

16. * Searches.

Give details of the sources to be searched, search dates (from and to), and any restrictions (e.g. language or publication period). The full search strategy is not required, but may be supplied as a link or attachment.

A systematic review of the literature, including published reviews, will be undertaken. Studies published between Jan 1st, 2000 and September 30th, 2018 will be identified by searching online databases PubMed/MEDLINE, EMBASE, ScienceDirect, Springer Link, PsycINFO, Cochrane Library, and Web of Science without language restrictions. Japanese databases J-STAGE, Ichushi, UTokyo Resource Explorer (KIKEI) will also be searched. The reference lists of papers will be checked for additional literature searched.

conclusions described in these articles will be synthesized into a general analysis. This search will identify studies of migrant populations and including terms related to migrant health in Japan within the title, article or abstract.

Three central concepts (in English and Japanese) will be used in combination to guide this search with relevant search terms:

1) Mental Health Status: “mental health” OR “psychology” OR “mental well-being”.

2) Migrants: “migrant” OR “immigrant” OR “expatriate” OR “foreigner” OR “refugee” OR “foreign national” OR “international student”.

3) Location: “Japan”.

Additional search strategy information can be found in the attached PDF document (link provided below).

17. URL to search strategy.

Give a link to a published pdf/word document detailing either the search strategy or an example of a search strategy for a specific database if available (including the keywords that will be used in the search strategies), or upload your search strategy.Do NOT provide links to your search results.

https://www.crd.york.ac.uk/PROSPEROFILES/108421_STRATEGY_20181002.pdf

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Yes I give permission for this file to be made publicly available

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied. This could include health and wellbeing outcomes.

Pre- and post-migratory barriers or facilitators of mental well-being for migrants residing in Japan.

The migrant community in Japan is an ethnically diverse group but, as a whole, represents the largest minority in the country. Since the turn of the century more and more studies have examined the health of these migrants as a unique case for cross-cultural study. Disparate research has focused on the mental health of specific migrant sub-populations. Regrettably, this body of literature is currently not very rich, underscoring the value of a systematic review synthesize the literature into a more comprehensive representations of migrant mental health and well-being in Japan as the barriers to and facilitators of mental health well-being, that are at work both before and after migration among this unique population. Additionally, we will examine challenges for the preservation of mental well-being of foreign nationals residing in Japan and how they could be addressed. This review of migrant mental well-being may serve as a barometer of Japan’s preparedness for proper integration of this increasingly vital and populous cohort. This systematic review represents a timely addition to the growing Global Health discipline of migrant health.

19. * Participants/population.

Give summary criteria for the participants or populations being studied by the review. The preferred format includes details of both inclusion and exclusion criteria.

Migrants defined as: persons of non-Japanese nationality residing in Japan for more than three months (eligible for National Health Insurance scheme).

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the nature of the interventions or the exposures to be reviewed.

Exposure: assessment of mental health status.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the main subject/topic of the review will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

Not applicable.

22. * Types of study to be included.

Give details of the types of study (study designs) eligible for inclusion in the review. If there are no restrictions on the types of study design eligible for inclusion, or certain study types are excluded, this should be stated. The preferred format includes details of both inclusion and exclusion criteria.

Original research in English and Japanese of all study designs will be included such as randomized controlled trials, quasi-experimental studies, observational studies, cross-sectional studies, systematic reviews and other comparative studies as well as multiple cases studies and evaluation reports. Conference abstracts or papers will not be included.

23. Context.

Give summary details of the setting and other relevant characteristics which help define the inclusion or exclusion criteria.

Global migration has been increasing remarkably for the past two decades and international migrants now constitute 3.4% of the global population (UNDESA, 2017). Migrants are “any person who lives temporarily or permanently in a country where he or she was not born, and has acquired some significant social ties to [their new location]” (UNESCO, 2017). The political response to such an explosion in migration has often been a policy of discrimination, which has negatively impacted the health of the generally young migrant populations (International Organization for Migration (IOM), 2018). Migrants have a ‘right to health’, as stated in the Declaration of Alma-Ata, 1978, where receiving countries are asked to adopt a comprehensive approach to health care of such sojourners beyond just infectious disease control (IOM, 2015). The pre- and post-migration periods have been shown to exhibit unique stressors on the mental well-being of international migrants that can necessitate psychological intervention at the community and/or clinical level (Bhugra, 2004). In the context of global migration, Japan, the international model of Universal Health Coverage (UHC),

currently has migrant population of more than 2.5 million which makes up almost 2.5% of the national population (Ministry of Internal Affairs and Communications, 2015). While the number of 'foreign residents' continues to accelerate as the ethnically Japanese population is predicted to decline by at least 30% by 2065 (National Institute of Population and Social Security Research, 2016), the government has been criticized for an official reluctance to openly discuss immigration reform.

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

Post-migration determinants of mental health and well-being.

Timing and effect measures

Pre- and post-migration.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

None.

Timing and effect measures

26. * Data extraction (selection and coding).

Give the procedure for selecting studies for the review and extracting data, including the number of researchers involved and how discrepancies will be resolved. List the data to be extracted.

MS Excel will be used for recording search results and the Mendeley referencing platform will be used to manage retrieved articles. MS Excel will again be used for extracted data charting in order to categorize and analyze individual studies. The charting step will involve the documentation of key characteristics and information of the articles being reviewed.

Data to be extracted:

citation (author, publication year), study location, study design, study population characteristics, sample size, study tools, comparative population, pre-migration barriers or facilitators of mental well-being, post-migration barriers or facilitators of mental well-being, and recommendations based on outcomes.

27. * Risk of bias (quality) assessment.

State whether and how risk of bias will be assessed (including the number of researchers involved and how discrepancies will be resolved), how the quality of individual studies will be assessed, and whether and how this will influence the planned synthesis.

A quality assessment checklist will be created to evaluate the appropriateness of included studies for assessment of mental well-being. The Newcastle Ottawa Quality Assessment Scale for Cohort and Cross-Sectional Studies (Wells et al., 2000) will be used as a guide to develop a modified quality assessment tool.

With our own quality measurement, we will able to see how well the selected studies are equipped to answer the quality assessment tool will assess by answering the scope of the literature for any gaps.

1. Were pre-migration determinants of mental health considered (e.g., medical history, country of origin, socio-economic status, ethnicity, social support)?

2. Were post-migration determinants of mental health considered (e.g., acculturation ability, length of residence, language fluency, cultural fluency, income, social support)?

3. Was there a non-migrant comparison group?

4. Were determinants measured in a valid, standardized manner (survey, psychometric tool or structured interview)?

5. Was the sample size appropriate to measure to address the mental issue being studied?

28. * Strategy for data synthesis.

Give the planned general approach to synthesis, e.g. whether aggregate or individual participant data will be used and whether a quantitative or narrative (descriptive) synthesis is planned. It is acceptable to state that a quantitative synthesis will be used if the included studies are sufficiently homogenous.

The PRIMSA checklist will be followed for appropriate data synthesis. A PRISMA flowchart will be constructed to reflect the search strategy and study selection stages. We anticipate that the data will be heterogeneous and so will form the basis for analysis using the 'descriptive-analytical method' from the narrative tradition (Arksey and O'Malley, 2005), which involves collecting standard information from each research report and applying a common analytic framework to all included studies. We will not pre-define the way in which the relationships among concepts will be evaluated and we will accept measures of the outcomes based on the study's assessment using either qualitative or quantitative methods.

29. * Analysis of subgroups or subsets.

Give details of any plans for the separate presentation, exploration or analysis of different types of participants (e.g. by age, disease status, ethnicity, socioeconomic status, presence or absence or co-morbidities); different types of intervention (e.g. drug dose, presence or absence of particular components of intervention); different settings (e.g. country, acute or primary care sector, professional or family care); or different types of study (e.g. randomised or non-randomised).

Subgroup analysis will be conducted for pre- and post-migration determinants of mental well-being.

30. * Type and method of review.

Select the type of review and the review method from the lists below. Select the health area(s) of interest for your review.

Type of review

Cost effectiveness
No

Diagnostic
No

Epidemiologic
Yes

Individual patient data (IPD) meta-analysis
No

Intervention
No

Meta-analysis
No

Methodology
No

Narrative synthesis
Yes

Network meta-analysis
No

Pre-clinical
No

Prevention
No

Prognostic
No

Prospective meta-analysis (PMA)
No

Review of reviews
No

Service delivery
No

Synthesis of qualitative studies
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
No

Care of the elderly
No

Child health
No

Complementary therapies
No

Crime and justice
No

Dental
No

Digestive system

No

Ear, nose and throat
No

Education
No

Endocrine and metabolic disorders
No

Eye disorders
No

General interest
No

Genetics
No

Health inequalities/health equity
Yes

Infections and infestations
No

International development
No

Mental health and behavioural conditions
Yes

Musculoskeletal
No

Neurological
No

Nursing
No

Obstetrics and gynaecology
No

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
No

Public health (including social determinants of health)
Yes

Rehabilitation
No

Respiratory disorders
No

Service delivery
No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents
No

Violence and abuse
No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.
English
Japanese

There is an English language summary.

32. Country.

Select the country in which the review is being carried out from the drop down list. For multi-national collaborations select all the countries involved.

Japan

33. Other registration details.

Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or The Joanna Briggs Institute) together with any unique identification number assigned. (N.B. Registration details for Cochrane protocols will be automatically entered). If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

Give the citation and link for the published protocol, if there is one

Give the link to the published protocol.

Alternatively, upload your published protocol to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Give brief details of plans for communicating essential messages from the review to the appropriate audiences.

The review will be published in an international peer-reviewed journal, yet to be decided.

Do you intend to publish the review on completion?

Yes

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36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords will help users find the review in the Register (the words do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Japan; Migrants; Mental Health; Mental Well-Being

37. Details of any existing review of the same topic by the same authors.

Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible.

38. * Current review status.

Review status should be updated when the review is completed and when it is published. For newregistrations the review must be Ongoing.

Please provide anticipated publication date

Review_Completed_not_published

39. Any additional information.

Provide any other information the review team feel is relevant to the registration of the review.

40. Details of final report/publication(s).

This field should be left empty until details of the completed review are available.

Give the link to the published review.

Reporting checklist for systematic review and meta-analysis.

Based on the PRISMA guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA reporting guidelines, and cite them as:

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement

		Reporting Item	Page Number
	#1	Identify the report as a systematic review, meta-analysis, or both.	1
Structured summary	#2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number	2
Rationale	#3	Describe the rationale for the review in the context of what is already known.	2
Objectives	#4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	2
Protocol and registration	#5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address) and, if available, provide registration information including the registration number.	6

Eligibility criteria	#6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rational	7
Information sources	#7	Describe all information sources in the search (e.g., databases with dates of coverage, contact with study authors to identify additional studies) and date last searched.	6
Search	#8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	6
Study selection	#9	State the process for selecting studies (i.e., for screening, for determining eligibility, for inclusion in the systematic review, and, if applicable, for inclusion in the meta-analysis).	8
Data collection process	#10	Describe the method of data extraction from reports (e.g., piloted forms, independently by two reviewers) and any processes for obtaining and confirming data from investigators.	8
Data items	#11	List and define all variables for which data were sought (e.g., PICOS, funding sources), and any assumptions and simplifications made.	8
Risk of bias in individual studies	#12	Describe methods used for assessing risk of bias in individual studies (including specification of whether this was done at the study or outcome level, or both), and how this information is to be used in any data synthesis.	9
Summary measures	#13	State the principal summary measures (e.g., risk ratio, difference in means).	9
Planned methods of analyis	#14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis.	9
Risk of bias across studies	#15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	9
Additional analyses	#16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	9
Study selection	#17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	10
Study	#18	For each study, present characteristics for which data were extracted (e.g.,	11

characteristics		study size, PICOS, follow-up period) and provide the citation.	
Risk of bias within studies	#19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	9
Results of individual studies	#20	For all outcomes considered (benefits and harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and confidence intervals, ideally with a forest plot.	12
Synthesis of results	#21	Present the main results of the review. If meta-analyses are done, include for each, confidence intervals and measures of consistency.	12
Risk of bias across studies	#22	Present results of any assessment of risk of bias across studies (see Item 15).	13
Additional analysis	#23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	13
Summary of Evidence	#24	Summarize the main findings, including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers	14
Limitations	#25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	17
Conclusions	#26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	20
Funding	#27	Describe sources of funding or other support (e.g., supply of data) for the systematic review; role of funders for the systematic review.	21

This checklist was completed on 17. February 2019 using https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with Penelope.ai

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Mental Well-Being of International Migrants to Japan: a Systematic Review

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Mental Well-Being of International Migrants to Japan: a Systematic Review

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Abstract

Background Migration is a stressful process of resettlement and acculturation that can often negatively impact the mental health of migrants. In Japan, international migration is growing steadily amid an aging domestic population experiencing severe labor shortages.

Objectives To identify the contemporary barriers to, and facilitators of, mental well-being among the migrant population in Japan.

Design Systematic review

Data sources PubMed, ProQuest, Web of Science, Ichushi and J-Stage

Eligibility criteria Research articles examining the mental well-being of international migrants in Japan that were published in English or Japanese between January 2000 and September 2018 were included.

Data extraction and synthesis Full-texts of relevant articles were screened and references of the included studies were hand-searched for further admissible articles. Study characteristics, mental well-being facilitators and barriers, as well as policy recommendations were synthesized into categorical observations and were then thematically analyzed.

Results Fifty-five studies (23 published in English), surveying a total of 8,649 migrants, were identified. The most commonly studied migrant nationalities were Brazilian (36%), followed by Chinese (27%) and Filipino (8%). Thematic analysis of barriers to mental well-being among migrants chiefly identified “language difficulties”, “being female” and “lack of social support”, whereas the primary facilitators were “social networks” followed by

"cultural identity". Policy recommendations for authorities included more migrant support services and transcultural awareness among the Japanese public.

Conclusion Access to social support networks of various types appears to be an influential factor affecting the mental well-being of international migrants in Japan. More research is necessary on how to promote such connections to foster a more inclusive and multicultural Japanese society amid rapid demographic change.

PROSPERO registration number CRD42018108421

Keywords: Mental Well-being; Japan; Migration

Article Summary

Strengths and limitations of this study

- Our study is the first to comprehensively screen and synthesizes available research, published both in Japanese and English, on the mental well-being of international migrants to Japan.
- Key findings were extracted and thematically analyzed from relevant studies of diverse migrant populations in Japan evidencing the role of social support networks.
- The cross-sectional nature of the included studies limits the value in supporting causal effects and generalizability.
- While English and Japanese databases were surveyed, grey literature was not comprehensively searched.

Introduction

Global migration has increased markedly in recent decades and international migrants now constitute 3.4% of the global population.[1] International migrants are considered to be "any person who lives temporarily or permanently in a country where he or she was not

born, and has acquired some significant social ties to [their] new location".[2] Therefore migrants include non-indigenous people who are long-term immigrants, organizational expatriates, international students and migrant workers as well as forced migrants such as asylum seekers and refugees. While motivated by push and pull factors based on perceived opportunity, international migration has been well-documented to be a stressful, multi-factorial process that can adversely affect health.[2-4] The 'right to health' of migrants is enshrined in the Declaration of Alma-Ata (1978) and states receiving countries should take a comprehensive approach to health care of such sojourners beyond basic infectious disease control.[5] Accordingly, migration is increasingly recognized as a structural socioeconomic force that influences health outcomes as a social determinant of health, in general, and mental health, in particular.[6, 7]

As the world's third largest economy, Japan was home to 2.2 million international migrants in October 2018. This figure represents about 2% of the national population and approximately 200,000 foreign nationals were newly settled during that year.[8] While the number of foreign residents settling in Japan continues to accelerate, the total population of Japan is predicted to decline by 31% from a peak of 126 million in 2016 to 87 million by 2060.[9] Japan is a harbinger of the future as the first nation in human history to experience population decline due to "super-aging". Other developed nations like Germany and Italy, are on a similar demographic trajectories and such changes will swiftly increase the proportion of comparatively young foreign national populations.[10] However, unlike other developed countries with a history of large-scale, institutional health research that includes

non-citizens,[11] in Japan, mainly exploratory research has been conducted on the health of migrants.

Facing a serious demographic challenge, the Japanese government has begun to publicly acknowledge the need for more foreign workers; however, structural issues continue to perturb the humanistic integration of international migrants. For example, a comprehensive 2017 survey showed that 30% of foreign residents had experienced discrimination in Japan, with 40% having been rebuffed when seeking housing and 25% had been denied a job due to their nationality.[12] Additionally, the Migration Integration Policy Index (MPIX) recently highlighted strict working visa requirements and a culture of overwork and harassment in Japan leading to occupational morbidity;[13] such 'push' factors may impact the positive functioning of migrants as part of Japanese society.

The World Health Organization (WHO) defines mental health as, "a state of well-being where every individual can realize his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community".[14] Mental well-being is a dual continuum that includes mental health and positive functioning open to sociocultural interpretation and includes concepts such as contentment, absence of negative life determinants, absence of disease, or economic prosperity.[14]

Japan as a host nation, has a unique cultural and linguistic context in which the mental well-being and related supports for migrants are likely impacted. To the best of our knowledge, there has been no synthesis of the literature on the mental health or well-being of international migrants to Japan. In order to examine the social determinants of mental

well-being among migrants as barriers to, and facilitators of, this subject was systematically reviewed. Our findings are a timely addition to the growing global health discipline of migrant health and may also provide authorities with an evidence base for further immigration reform and social design.

Methods

Patient and Public Involvement statement

Patients and the public were not involved in this study.

Study description

This systematic review of observational studies was conducted in accordance with the 2009 Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) reporting guidelines.[15] The study protocol was registered at PROSPERO in September 2018 (https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=108421, registration No. CRD42018108421). As primary human health data was not used in this research, ethical approval was not required.

Inclusion and exclusion criteria

Study selection was purposively designed to be broad in order to scope the progress of research assessing a heterogenous health concept in an equally diverse population. *Migrant* was defined in line with the Japanese government guidelines as a foreign national living in Japan for three months or more.[8] Study inclusion criteria were: 1) published research

assessing mental well-being among international migrants in Japan; 2) quantitative and/or qualitative methodologies examining more than one migrant, including systematic reviews; 3) studies published in English or Japanese. Exclusion criteria were 1) conference proceedings, expert opinions, single case reports or reviews; 2) analysis of international tourists, 3) studies published prior to January 2000. Mental well-being (including mental health outcomes such as depression, anxiety, resilience, etc.) must have been assessed using a standardized research method including epidemiological surveys, interviews or medical records.

Search strategy

Electronic databases were searched for publications published between January 2000 and September 2018. This timeframe was chosen to include studies that reflect the contemporary migrant population of Japan to be more useful in directing current social policy. The following databases were queried: PubMed, UTokyo Resource Explorer (UTREE; includes Proquest, SpringerLink, ScienceDirect) and Web of Science; as well as Japanese databases Igaku-chuo-zasshi (Ichushi; https://search.jamas.or.jp/) and J-STAGE (https://www.jstage.jst.go.jp/) each of which cite over 300,000 articles per year from 2,500 Japanese biomedical journals. The search was completed in September 2018, and the English as well as Japanese search terms are listed in Table 1. Both sets of search terms were used to query each database.

Table 1. Search Terms

English	Japanese
"Mental health" OR "Psychology" OR "Mental well-being" AND	"精神保健" OR "メンタルヘルス" OR "心の健康" OR "精神衛生" AND
"Migrant" OR "Immigrant" OR "Expatriate" OR "Foreigner" OR "Refugee" OR "Foreign resident" OR "International student" AND	"居住者" OR "駐在員" OR "労働者" OR "移住者" OR "難民" OR "留学生" OR " 在留外国人" AND
"Japan"	"在日" OR "日本における外国人" OR "在留"

Selection and retrieval process

Based upon the above selection criteria, two researchers (RM, YT) independently evaluated each title and abstract for inclusion. After removing duplicates, 1,255 compiled titles were screened for relevance to the study topic, then study abstracts were read to confirm relevance. Any ambiguities throughout the selection process were discussed with a third researcher (KICO) and arbitrated through group consensus. After review, all but 80 titles were removed for full text review due to being inappropriate publication type, not on migrants in Japan or not examining an element of mental well-being. Full texts were reviewed to ensure the publications met all inclusion criteria. After this process, the remaining 55 full texts were included in data synthesis. References in these articles were hand-searched revealing 28 potentially useful references. All full texts were located via the University of Tokyo library system or in case of difficult to locate manuscripts, by contacting the first author directly. Figure 1 is a PRISMA flow diagram of our screening process.[15]

Data extraction

A review library of included studies was made of PDF files using Mendeley referencing software. Data were extracted independently into Excel by the primary researchers (RM, YT). Extracted data (Supplementary Table 1) included first author, year of publication, study design, study area (city or region), subject nationality (<four largest groups are specified), number of subjects, mental health variable assessed, epidemiological tool employed, significant barriers as well as facilitators of mental well-being and subsequent policy recommendations. Non-significant factors discussed by the study authors were not included. Strategies and data presentation were discussed by researchers throughout the process to harmonize search and extraction strategies.

Quality/bias assessment

Study quality was assessed during data extraction using five specific criteria appropriate for the heterogeneity of the included studies which were adapted from the main guidelines of the Newcastle Ottawa Quality Assessment Scale for Cohort and Cross-Sectional Studies (NOS): selection, comparability and outcomes (Supplementary Table 2). These criteria were as follows: consideration of pre-migration factors, consideration of post-migration factors; inclusion of a non-migrant comparison group; use of a valid measurement tool; justification of satisfactory sample size. A score of 1–5 were assigned to each study based on these criteria. Publications with scores 1-2 were labelled ‘poor quality’, 3 were considered ‘average quality’ and 4-5 were of ‘good quality’. An experienced third reviewer was consulted (KICO) when assessing quality and potential publication bias.

Data analysis

In total, 55 full articles were included in our analysis. Due to the significant heterogeneity among study themes, populations and methodologies, a thematic synthesis was conducted instead of a meta-analysis. We did not pre-define the way in which the relationships among concepts were evaluated within studies and accepted outcome measures based on the author's qualitative and/or quantitative assessment. Thematic analysis was used to group barriers and facilitators identified by included studies to have a significant association with their respective mental health variable of interest.

Results

Description of studies

In total 55 studies examining the mental well-being of international migrants in Japan were selected for this review (for a detailed selection flowchart see Figure 1). There were 13 studies examining international university students studying in Japan and one of Brazilian middle school students (the youngest cohort assessed in this study).[16-29] Eleven studies exclusively examined migrant workers;[30-36] four studies were on the mental well-being of Economic Partnership Agreement (EPA) care workers specifically [37-40]. Two studies enrolled non-pregnant migrants,[41, 42] and eight exclusively analyzed mothers.[43-50] The remaining nine studies were of general migrant populations of a single (n=5) or various (n=4) nationalities.[51-59] Remarkably, there were ten studies specifically examining

Brazilians of Japanese descent, making them the most studied nation-specific migrant subgrouping in terms of mental well-being.[60-70]

In total, 8,649 migrants were surveyed. This calculation excludes >2,000 migrants reviewed in each of two systematic reviews.[44, 46] All subjects were recruited from the community or retrospectively from clinical records. On average three studies per year (range, 1 to 5) were consistently published on this topic since 2000. Of the included studies, 23 were published in English while the remaining were in Japanese. Their study designs were cross-sectional (n=40; one in four utilizing a comparative population), qualitative (n=7), case series (n=3), mixed methods (n=3) and systematic review (n=2). Most studies were conducted in specific major metropolitan areas, such as Tokyo, Osaka, Sapporo, etc. As study location was sometimes anonymized, it was inferred that almost all studies were completed within central Japan in an urban setting. The number of subjects per study ranged from 3–1,252, with a median size of 119. Importantly, a small number of migrants (<75) were explicitly not enrolled in a health insurance plan; the only studies that listed this variable were those of Nepalese[51] or Brazilians migrants.[60-70]

Sample nationalities

Of the migrants surveyed, 36% were Brazilian, 27% Chinese and 8% Filipino. Each nationality was exclusively studied in 14, 10, and 3 publications, respectively. The remaining 28 studies examined a mixed international migrant population. The four most numerous nationalities from each report were specifically extracted from a heterogeneous

sample population, any remaining nationalities were identified as 'various' in Supplementary Table 1.

Mental health variables and tools

Almost every observational study employed some unvalidated survey questions in addition to at least one previously validated survey tool (in part or whole). Non-validated questions were marked as a 'questionnaire' tool in Supplementary Table 1. Additionally, 33 epidemiological tools used to measure mental well-being are noted, with an abbreviation legend in Supplementary Table 3.

Thematic analysis

More barriers than facilitators to mental well-being were cited among the included studies and multiple themes were often described in a single study.

Barriers

Among the included studies, the most common barrier was trouble communicating in Japanese as 10 studies described such difficulty as negatively impacting mental health. These studies cited language barriers creating stress of managing daily life or trouble describing symptoms in a medical environment. The next most common barrier was a lack of support, either from teachers,[16] employers,[31, 40] family,[45] or healthcare professionals.[43, 44] These findings were very similar to a described lack of social networks (isolation or living alone) described in 11 studies. The third most common barrier

to mental well-being was 'being female' cited in nine studies. Nine studies also mentioned various sources of stress, like acculturation,[17] child-rearing,[43] or finances.[24] Occupational stress,[30, 31, 38, 40] and discrimination [20, 23, 31, 46] were each mentioned in four studies along with age over 30 years,[34, 36] and living in Japan for more than one year,[17, 62] each described in two studies.

Facilitators

Social and support networks were found to be robust facilitators of mental well-being. These two concepts were mentioned 25 times as statistically significant outcomes. Some examples of such support included in study, job or daily life,[18, 38] living with family versus living alone,[43, 60] connecting with friends,[48, 69] or maintaining connections with the migrant community.[41] Occupational factors such as job satisfaction were noted nine times. Facilitators mentioned four times or fewer included: strong cultural identity, cultural adaptability, longer stay in Japan, coping skills, age under 30 years and Japanese fluency. Remarkably, 'being female' was also found to be a facilitator in one study.

Policy Recommendations

Two themes among policy recommendations were identified: calls for the creation of various support systems targeted at the migrant population by the government and calls for transcultural education of the public about migrants. Proposed support systems were medical (n=15), educational (n=7), occupational (n=3) and general (n=10). The types of

transcultural education authors described included fostering awareness of migrant cultural backgrounds and promoting a positive image of international migrants in mass media.

Quality/bias of studies

Seventeen studies were found to be of high quality according to our criteria, while 33 were of average quality. This difference was due primarily to a failure to examine pre-migratory factors or employ a comparison group. Only four studies were considered of low quality and potentially biasing mainly due to their unjustified small sample size.[28, 44, 50, 54] Publication bias was assessed in cases of multiple publication or publishing in a suspected predatory journal; two studies were excluded for these reasons during review.

Discussion

Overall a complex picture of this heterogeneous migrant population and factors impacting their mental well-being emerged from this systematic review. Thematic analysis demonstrated the access to social support to be the most common determinant (barrier to or facilitator of) mental well-being among international migrants in Japan. Several other factors such as discrimination language skills and length of stay were also found to impact their mental well-being. Based on these findings, researchers often called for the creation of more migrant-focused support programs and transcultural training for the Japanese public to reduce such health gaps.

Psychosomatic symptoms, such as depression, among other mental disruptions were found to be significantly associated with a lack of support. For example, in a few studies

those without social support were reluctant to seek medical consultation perhaps due to language barriers or without encouragement from others.[46] Additionally, stress was reported to originate from many sources including: study,[27] child rearing,[48] family,[45] occupation,[46] and cultural adjustment.[18, 58, 66] When migration examined more broadly as a social determinant of health has been shown to lead to isolation and distress if there is a deficiency in social connection in a post-migratory setting.[71] Taken together, evidence from Japan suggests there is need for research into how migrants can identify social networks to support themselves as well as how host societies can foster such opportunities for migrants.

Several included studies found that living in Japan for short periods was a barrier to mental well-being while longer stays were facilitators. For example, Brazilians living in Japan for limited periods for work were found to have a higher prevalence of mental disorders.[60, 66, 70] On the other hand, a study by Tsuda *et al.* showed that Brazilians living in Japan for more than 5 years had fewer mental disorders.[63] In the assimilation theory of migration the length of residence in a host country and degree of proficiency in the host language also believed to positively influence the acculturation process within the first year of migration when there are more mental disturbances due to culture shock and changes in daily life.[72] Visa status or stability were not mentioned as a significant factor for mental well-being even among studies including subjects with a variety of visas; broader comparative studies of this topic may be warranted.

Contrastingly, studies by Qu *et al.* and Tsuji *et al.* found longer stays to be associated with worse well-being among different migrant populations.[17, 68] These

findings support the cumulative disadvantage theory, which runs counter to the assimilation theory by suggesting that health-related disadvantages, such as persistent transcultural distress, increase with prolonged length of residence in a receiving country.[72] While length of stay was often protective to migrant mental health in aggregate, similar to our results, a previous systematic reviews of migrant health also found such findings varied between migrant surveys in Canada.[73]

Discrimination has been well-studied as part of the migrant experience.[74] Similarly, it was noted to be a factor associated with poorer mental well-being in several studies of various types of migrants in this study.[20, 23, 31, 46] For example, two studies of this population diverged as to whether the loss or maintenance of Chinese cultural identity are facilitators of mental well-being but both maintain Japanese society does not include them causing mental harm the longer they live in Japan.[17, 18] Interestingly, Asakura *et al.* reasoned that Brazilians workers with Japanese language skills experienced discrimination because these workers could comprehend their status as an outsider in Japanese society more clearly.[31] Examination of discrimination among skilled workers versus unskilled workers in Japan has also shown similar findings.[75]

The female gender and religiosity were found to be a barrier and facilitators of mental well-being, respectively. Ten studies concluded being female was a barrier to mental well-being; only one study suggested the female sex to be a facilitator of mental well-being.[29] This outlier assessed support-seeking behaviors among students, perhaps suggesting that while female migrants to Japan experience more barriers to mental well-being, they are more likely to reach out for solutions than males; as has been shown

previously in other immigrant populations.[71] Previous migration studies have noted that female migrants experience significantly poorer mental well-being than the indigenous population.[76] Additionally, several studies on Filipino, Brazilian and Muslim migrants established religiosity as a strong facilitator of mental well-being.[32, 41, 43] Cultural identity and religiosity as facilitators of mental well-being are consistent with previous research on cultural identity and religious beliefs among migrants.[77]

Most of the studies surveyed in this review had general recommendations for the Japanese government, health authorities or society at large. As might be expected, the most discussed recommendation was the implementation of various support systems ranging from Japanese language education, medical systems and personal support networks. Such supports, like the provision of translated information and consultation desks, may address barriers for migrants; encouragingly local authorities have or are planning to implement many such mechanisms.[78] Notably absent from such government-backed systems, however, is support for a comprehensive medical interpretation system for healthcare institutions.[79]

A more novel suggestion raised by fewer publications was the importance of transcultural education about diversity or appreciation of different cultural backgrounds. This due in part to generalization on the part of mass media and a general lack of awareness among the domestic population as the Japanese the word *imin*, immigrant, is generally only applied to low-skilled workers.[80] For example, representative studies called for a more positive characterization of migrants by the mass media while other authors stressed the importance of transcultural competence both in the workplace and medical centers by

domestic staff.[18, 55] More research about diversity education in Japan may help to address the social determinants of migrant mental health.

Robust sampling in migration research is understood to be difficult because migrant populations are inherently mobile and often prefer to remain unidentified; thus, migrant research is chronically underfunded as research agencies are reluctant to award grants where rigorous methodology does not exist.[3] Most studies on migrant mental well-being in Japan were community-based and used convenience or snowball sampling. Unsurprisingly, study populations were small, as half of studies enrolled less than 119 participants and only one publication included explicit sample size calculations.[64] The study with by far the largest sample size, utilized government survey records from Hamamatsu, Ibaraki Prefecture, to study the social connectedness of 1,252 Brazilians migrants.[65] There were also four retrospective surveys of institutional medical records over several years identified by our study.[27, 52, 54, 60] Taking into account the difficulty of sampling, samples were viewed as often justifiable to measure specific communities but representative cross-sections of entire migrant populations. In contrast, in their systematic review of immigrant women in the perinatal period, Kita *et al.* surveyed more than ten studies with large samples sizes that reviewed Japanese medical or governmental records.[46] Improving the rigor in migrant health research in Japan will, require more analyses of health records and secondary analysis of government administered surveys like the large-scale surveys including migrants that are regularly carried out in the European Union.[81]

Next, the representativeness of migrant sampling, in terms of proportionality to the

foreign community in Japan, was found to be skewed. The most populous migrant populations represented in our study were Brazilian (37%), Chinese (27%), Filipino (8%) and Korean (4%). It seems that Brazilian migrants and students, particularly Chinese students, have received more research attention in Japan. In reality, according to the Ministry of Justice, the four most populous migrant nationalities as of 2018, in descending order, were Chinese (29%), Korean (18%), Vietnamese (10%) and Filipino (10%).[82] The Nepalese and Vietnamese populations in Japan have exploded since 2015,[8] and related research is only just appearing in the literature. Such research biases are remarkable and may carry across migrant studies in Japan and should be addressed for accurate scoping of migrant health.[83]

Migrants to Japan are relatively understudied compared to migrants in other high-income countries, especially in terms of mental health status. While the may be due to their comparatively low proportion (>12% in both Germany and UK), Japanese society is at a critical juncture with new visa categories launched in April 2019 dramatically increasing the number of foreign workers.[84] Key health policy documents, such as the WHO Japan Health System Review, discuss health equity in depth but still only mention migrant health in passing.[85] As it becomes clear that Japan perhaps needs international migrants perhaps more than the reverse, questions remain about whether Japanese social leaders are prepared to facilitate positive mental well-being to create a flourishing society together with migrants regardless of nationality and socioeconomic status.

There are limitations to this systematic review that should be noted. Most of the studies reviewed were cross-sectional and therefore could only describe correlation and not

causation so the strength of actionable conclusions may be impacted. As a narrative approach was taken to data synthesis, all studies were given an equal weight regardless of size, level of significance and quality which could have given undue influence on the findings of four included studies of lower quality. Heterogeneity testing or subgroup analysis of the surveyed literature were not done as part of a meta-analysis leaving the study qualitative in nature. Additionally, grey literature was not assessed, potentially leaving out valuable findings on this topic. The strengths of this systematic review are its comprehensive nature in terms of search strategy and data analysis as well as examining publications published in Japanese. In this way readers can better understand the diversity of the foreign resident population of Japan from the prospective of mental well-being.

Conclusion

The evidence gathered in this systematic review suggests the presence or absence of social support networks for migrants is the main determinant of mental well-being among foreign nationals living in Japan. While promotion of such ties is appropriate, the importance of promoting diversity awareness among healthcare professionals and society-at-large may be under-appreciated. Taken together, our results show that the mental well-being of migrants in Japan requires more investigation about how to best support the integration of international migrants in Japan to actionable government policy.

Figure Legend

Figure 1. Flow diagram of studies that were identified using the search terms and strategy, articles screened for eligibility, included/excluded with reasons, following PRISMA guidelines.

Table 1. Search terms used during systematic review of the literature.

Supplementary Table 1. Study characteristics and mental well-being factors extracted from the reviewed studies.

Supplementary Table 2. Quality assessment of the reviewed studies based on the core principles of the Newcastle Ottawa Quality Assessment Scale for Cohort and Cross-Sectional Studies (NOS): selection, comparability and outcomes.

Supplementary Table 3. List of abbreviations for epidemiological tools employed in the reviewed studies.

Footnotes

Author Contributions: Conception and design: RM, YT, KICO and MJ. Search strategy: RM and YT. Screening, extraction and quality assessment: RM and YT. Analysis and interpretation of data: RM, YT, KICO, AS and MJ. Drafting of the manuscript: RM (all authors critically reviewed and approved manuscript).

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Declaration of interests: All authors declare no competing interests.

Patient consent: Not required.

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References

1. United Nations Educational, Scientific and Cultural Organization. Migrant/Migration [Internet]. [Updated 2016; cited 2018 Sept 1]. Available from: http://www.unesco.org/new/en/social-and-human-sciences/themes/international-migration/glossary/migrant/
2. Abubakar I, Aldridge RW, Devakumar D, et al. The UCL–Lancet Commission on Migration and Health: the health of a world on the move. Lancet 2018;**392**:2606-54.
3. Renzaho AM. *Globalisation, migration and health: Challenges and opportunities.* 1st ed. London: Imperial College Press. 2016.

4. Virupaksha HG, Kumar A, Nirmala BP. Migration and mental health: An interface. *J Natural Sci Bio Med* 2014;**5**:233. doi: 10.4103/0976-9668.136141

5. International Organization for Migration. World Migration Report 2018 [Internet]. [Updated 2018; cited 2018 Dec 3]. Available from: https://www.iom.int/wmr/world-migration-report-2018

6. Castañeda H, Holmes S, Madrigal D, et al. Immigration as a Social Determinant of Health. *Ann Rev Pub Health* 2015;**36**:375-392. doi:10.1146/annurev-publhealth-032013-182419

7. Salami B, Yaskina M, Hegadoren K, et al. Migration and social determinants of mental health: Results from the Canadian Health Measures Survey. *Can J Pub Health* 2017;**108**:e362-e367. doi:10.17269/cjph.108.6105

8. Ministry of Justice. Foreign National Residents by Nationality [Internet]. [Updated 2019; cited 2 February 2019]. Available from: http://www.stat.go.jp/english/data/nenkan/68nenkan/1431-02.html

9. Ministry of Internal Affairs and Communications, Statistics Bureau. Future Population (2016 to 2110) [XLS]. [Updated 2017; cited 2018 Dec 15]. Available from: http://www.stat.go.jp/english/data/jinsui/2.html

10. Parsons AJQ, Gilmour S. An evaluation of fertility- and migration-based policy responses to Japan's ageing population. *PLoS One* 2018;**13**:e0209285. doi:10.1371/journal.pone.0209285.

11. Eikemo TA, Bambra C, Huijts T, Fitzgerald R. The First Pan-European Sociological Health Inequalities Survey of the General Population: The European

Social Survey Rotating Module on the Social Determinants of Health, *Euro Socio Rev* 2017;**33**:137–153.

12. Ministry of Justice. Analytical Report of the Foreign Residents Survey -Revised Edition-. [Updated 2017; Accessed 2018 Dec 25]. Available from: http://www.moj.go.jp/content/001249011.pdf.
13. Migration Integration Policy Index. Japan: Key Findings [Internet]. [Updated 2015; cited: 2019 Jan 1]. Available from: http://www.mipex.eu/japan
14. World Health Organization. Mental health: a state of well-being [Internet]. [Updated 2014, cited 2018 Sept 1]. Available from: http://who.int/features/factfiles/mental_health/en/
15. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med **6**(7): e1000097. doi:10.1371/journal.pmed1000097
16. Kakefuda A. A study into mental health of Japanese-Brazilian students [in Japanese]. J *Psyche, Cult* 2004;**3**:67-72.
17. Qu X, Li L. Attachment, Acculturation and GHQ-30 of Chinese Students in Japan. *Psychol Stud* 2013 **59**:145-150. doi:10.1007/s12646-013-0192-z
18. Sun Y. Chinese students in Japan: The mediator and the moderator between their personality and mental health. *Int J Psychol* 2013;**48**:215-223. doi:10.1080/00207594.2011.648942

19. Eskanadrieh S, Liu Y, Yamashina H, et al. Depressive symptoms among international university students in northern Japan: Prevalence and associated factors [in Japanese]. *Int Health* 2012;**27**:165-170.

20. Murphy-Shigematsu S. Psychological barriers for international students in Japan. *Int J Adv Couns* 2002;**24**:19-30. doi:10.1023/A:1015076202649

21. Guo Y, Li Y, Ito N. Exploring the Predicted Effect of Social Networking Site Use on Perceived Social Capital and Psychological Well-Being of Chinese International Students in Japan. *Cyberpsychol, Behav Soc Net* 2013;**1**:1-7. doi:10.1089/cyber.2012.0537

22. Ozeki N, Knowles A, Ushijima H, Asada Y. Analysis of transcultural stress factors and the mental well-being of foreign Chinese-speaking students in Aomori. *J Aomori U. Health Welf* 2006;**7**(1):8-16.

23. Zheng G, Jimba M, Wakai S. Exploratory Study on Psychosocial Impact of the Severe Acute Respiratory Syndrome (SARS) Outbreak on Chinese Students Living in Japan. *Asia Pac J Pub Health* 2005;**17**(2):124-129.

24. Kono K, Eskandarieh S, Obayashi Y, Arai A, Tamashiro H. Mental Health and Its Associated Variables Among International Students at a Japanese University: With Special Reference to Their Financial Status. *J Immigr Minor Health* 2014;**17**(6):1654-1659. doi:10.1007/s10903-014-0100-1

25. Ma B. The relationship between mental health status and psychosociological factors among Chinese postgraduate students in Japan [in Japanese]. *Juntendo Med J*.2007;**53**:200-210.

26. Matsuda T, Tsuda A, Deng K. Relationship between Stage of Change for Stress Management Behavior and Mental Health among Chinese International Students in Japan. *Kurume U Psychol Res* 2013;**12**:44-49.

27. Hori T, Tachikawa H, Ishi T, et al. An Analysis of Mental Disorders of International Students Visiting the Mental Health Service at Tsukuba University Health Center. [in Japanese]. *Psych Neuro Jpn* 2012;**114**:3-12.

28. Wang F, Kyoko Y. Chinese self-sponsored overseas students' change tendency in mental health and relevant reasons [in Japanese]. *Psychol Rep Sophia U* 2009;**33**:109-125.

29. Mizuno H, Toshinori I. Relation of Sociological and Psychological Factors to Preferences Among Professional Helpers by Asian International Students in Japan [Japanese]. *Japanese J Educ Psychol* 2000;**48**:165-173.

30. Lee G. Job stress and mental health among high-skilled foreign workers (HFWs) in Japan: Comparative analysis between HFWs and Japanese workers [in Japanese]. *Stress Sci Res* 2015;**30**:90-101.

31. Asakura T, Gee GC, Nakayama K, Niwa S. Returning to the "Homeland": Work-Related Ethnic Discrimination and the Health of Japanese Brazilians In Japan. *Am J Public Health* 2008;**98**:743-750. doi:10.2105/AJPH.2007.117309

32. Onishi A, Murphy-Shigematsu S. Identity narratives of Muslim foreign workers in Japan. *J Community Appl Soc Psychol* 2003;**13**:224-239. doi:10.1002/casp.715

33. Ohara-Hirano Y. Cognitive Life Strains and Family Relationships of Filipino Migrant Workers in Japan. *Asian Pacific Migr J* 2000;**9**:365-374.

34. Date Y, Abe Y, Aoyagi K, et al. Depressive Symptoms in Chinese Factory Workers in Nagasaki, Japan. *Ind Health* 2009;**47**:376-382. doi:10.2486/indhealth.47.376

35. Ohara-Hirano Y. The Implication of Socio-economic Strain in Depression of Overseas Filipino Workers [in Japanese]. *Jpn Bulli Soc Psychiat* 2005;**14**:134-145.

36. Cho Y. Suicide prevention for foreign workers and trainees [in Japanese]. *Jpn J of Occup Ment Health* 2005;**13**(1):4-15.

37. Ohara-Hirano Y. The Mental Health Status of Indonesian Candidates Leaving for Japan under the Japan – Indonesia Economic Partnership Agreement : After the Great East Japan. *Int J Jpn Sociol* 2012;**21**:37-45. doi:10.1111/j.1475-6781.2012.01163.x

38. Nugraha S, Ohara-Hirano Y. The Mental Health Predictors of Indonesian EPA Nurses and Certified Care Worker Candidates in Japan 1. *Jpn Psychol Res* 2018;**58**:85-96. doi:10.1111/jpr.12100

39. Sato F, Hayakawa K, Kamide K. Investigation of mental health in Indonesian health workers immigrating to Japan under the Economic Partnership Agreement. *Nurs Health Sci* 2016;**18**:342-349. doi:10.1111/nhs.12275

40. Yamamoto T, Mizukami K. Occupational Stress among Nurses Working in Japan Through the Economic Partnership Agreement (EPA) [in Japanese]. *J Gen Fam Med* 2018;**41**(2):38-44.

41. Paillard-Borg S, Hallberg D. The Other Side of the Mirror : An Analytic Journalistic Approach to the Subjective Well-Being of Filipino Women Migrant Workers in Japan. *SAGE Open* 2018;**8**(1):0-10. doi:10.1177/2158244018757288

42. Shah R, Kiriya J, Shibanuma A, Jimba M. Use of modern contraceptive methods and its association with QOL among Nepalese female migrants living in Japan. *PLoS One* 2018;**13**:e0197243. doi:10.1371/journal.pone.0197243

43. Martinez M, Hatashita H, Suzuki H, et al. Socio-cultural Factors Affecting the Health of Pregnant and Puerperal Brazilian Women in Japan [in Japanese]. *J Int Heal* 2017;**32**:69-81.

44. Kawasaki C. Birth and Child-rearing Experiences of Immigrant Women in Japan and Their Support Needs: A Literature Review [in Japanese]. *Jpn Community Health Nurs* 2014;**16**:90-97.

45. Jin Q, Mori E, Sakajo A. Risk factors, cross-cultural stressors and postpartum depression among immigrant Chinese women in. *Int J Nurs Pract* 2016;**22**:38-47. doi:10.1111/ijn.12438

46. Kita S, Minatani M, Hikita N, Matsuzaki M, Shirashi M, Haruna M. A Systematic Review of the Physical, Mental, Social, and Economic Problems of Immigrant Women in the Perinatal Period in Japan. *J Immigr Minor Health* 2015;**17**:1863-1881. doi:10.1007/s10903-015-0192-2

47. Imai S, Kita S, Tobe H, Watanabe M, Nishizono-Maher A, Kamibeppu K. Postpartum depressive symptoms and their association with social support among foreign mothers in Japan at 3 to 4 months postpartum. *Int J Nurs Pract* 2017;**23**:1-9. doi:10.1111/ijn.12570

48. Bunketsu Y, Emori Y. Parenting stress of Chinese mothers living in Japan. [in Japanese]. *J Gen Fam Med* 2010;**33**:101-109.

49. Shimizu Y. Korean, Chinese, Brazilian mothers' child rearing stress in Japan. [in Japanese]. *Jpn J Matern Health* 2002;**43**:530-540.

50. Fujiwara Y, Horiuchi S. Immigrant women giving birth in Japan: Experience of loneliness and isolation [in Japanese]. *J Hum Care Stud* 2007;**8**:38-50.

51. Shakya P, Tanaka M, Shibanuma A, et al. Nepalese migrants in Japan : What is holding them back in getting access to healthcare ? *PLoS One* 2018;**13**:e0203645.

52. Koyama A, Okumi H, Matsuoka H, et al. The physical and psychological problems of immigrants to Japan who require psychosomatic care: A retrospective observational study. *Biopsychosoc Med* 2016;**10**:35-37. doi:10.1186/s13030-016-0052-x

53. Moon J, Mikami H. Difference in subjective well-being between ethnic Korean and Japanese elderly residents in an urban community in Japan. *Geriatr Gerontol Int* 2007;**7**:371-379. doi:10.1111/j.1447-0594.2007.00427.x

54. Koyama A, Niki M, Matsuoka H, et al. Psychological Problems for Non-Japanese Speaking Patients in Japan. *J Travel Med* 2012;**19**:324-326. doi:10.1111/j.1708-8305.2012.00645.x

55. Ichikawa M, Nakahara S, Wakai S. Effect of Post-Migration Detention on Mental Health Among Afghan Asylum Seekers in Japan. *Aust New Zeal J Psychiatry* 2006;**40**:341-346. doi:10.1080/j.1440-1614.2006.01800.x

56. Itoi Y. Acculturative Stress Among Cambodian Living in Japan [in Japanese]. *Jpn J Hum Sci Health-Soc Serv* 2007;**35**:51-58.

57. Fukaya H. Acculturative stress and depression among foreigners in Japan [in Japanese]. *Jpn Bull Soc Psychiat* 2002;**11**:11-19.

58. Ohara-Hirano Y. Study on Depression Experienced by Foreign Residents in Kyushu Area [in Japanese]. *Mem Kyushu U Sch Heal Sci* 2001;**28**:129-137. doi:10.15017/305

59. Lee CH, Min SK, Jeon WT, Kigawa M, Sugawara M. Mental health and quality of life of North Korean defectors living in Japan. *Asian J Psychiatr* 2009;**2**:95-99. doi:10.1016/j.ajp.2009.07.001

60. Miyasaka LS, Canasiro S, Abe Y, et al. Migration and mental health: Japanese Brazilians in Japan and in Brazil. *J Bras Psiquiatr* 2007;**56**:48-52.

61. Kondo S, Otsuka K, Sawaguchi GT, et al. Mental health status of Japanese-Brazilian children in Japan and Brazil. *Psychiatry Clin Neurosci* 2011;**65**:226-232. doi:10.1111/j.1440-1819.2011.02202.x

62. Asakura T, Murata AK. Demography, Immigration Background, Difficulties with Living in Japan , and Psychological Distress among Japanese Brazilians in Japan. *J Immigr Heal* 2006;**8**:325-338. doi:10.1007/s10903-006-9003-0

63. Tsuji K, Miyasaka LS, Otsuka K, Honda G, Kato S, Abe Y. Panic disorder cases in Japanese-Brazilians in Japan : Their ethnic and cultural confusion. *Psychiatry Clin Neurosci* 2001;**55**:127-130.

64. Miyasaka LS, Otsuka K, Tsuji K, et al. Mental health of two communities of Japanese- Brazilians : A comparative study in Japan and in Brazil. *Psychiatry Clin Neurosci* 2002;**56**:55-64.

65. Takenoshita H. Social Capital and Mental Health among Brazilian Immigrants in Japan. *Int J Japanese Sociol* 2015;**24**(1):48-64. doi:10.1111/ijjs.12036

66. Honda G, Otuka K, Kuniaki Y, Tsuji K, Abe Y. Psycho-social risk factors for mental disorder among Japanese-Brazilian in Japan [in Japanese]. *Jpn Bull Soc Psychiat* 2005;**14**:45-54.

67. Tsuji K, Miyasaka L, Otsuka K. Depression among immigrants to Japan - A mental health survey of Japanese-Brazilians [in Japanese]. *Jpn Bull Soc Psychiat* 2000;**9**(2):163-170.

68. Tsuji K, Miyasaka L, Otsuka K, et al. Influence of relationship between duration of residence in Japan and degree of adaptation on the mental health status of Japanese-Brazilian immigrants [in Japanese]. *Jpn Bull Soc Psychiat.* 2002;**10**(3):253-260.

69. Asakura T. The Association between Acculturation to Japan Life and Psycho-Somatic Distress among Japanese-Brazilian Students [in Japanese]. *Jpn J Sch Heal*. 2005;**46**(1):628-647.

70. Otsuka K, Miyasaka L, Honda G, Yamaga K, Kato S, Nakamura Y. Cultural adaptation and mental health among Brazilians of Japanese descent living in Japan [in Japanese]. *Jpn Bull Soc Psychiat.* 2001;**10**:149-158.

71. Salinero-Fort MÁ, del Otero-Sanz L, Martín-Madrazo C, et al. The relationship between social support and self-reported health status in immigrants: an adjusted analysis in the Madrid Cross Sectional Study. *BMC Fam Pract* 2011;**12**:46.

72. Dhadda A, Greene G. 'The Healthy Migrant Effect' for Mental Health in England: Propensity-score Matched Analysis Using the EMPIRIC Survey. *J Immigr Minor Health* 2017;**20**:799-808. doi: 10.1007/s10903-017-0570-z

73. Vang Z, Sigouin J, Flenon A. The Healthy Immigrant Effect in Canada: A Systematic Review. *Population Change and Lifecourse Strategic Knowledge Cluster Discussion Paper Series/ Un Réseau stratégique de connaissances Changements de population et parcours de vie Document de travail.* 2015;**3**:1-41.

74. Ibañez GE, Dillon F, Sanchez M, et al. Changes in Family Cohesion and Acculturative Stress among Recent Latino Immigrants. *J Ethn Cult Divers Soc Work* 2015;**24**:219-234. doi: 10.1080/15313204.2014.991979

75. Shun G. Are the Consequences of Experiencing Discrimination the same for Immigrants of Differing Socio-Economic Status In Japan? *Int Migr* 2017;**56**. doi: 10.1111/imig.12370

76. Depressive symptoms among migrants and non-migrants in Europe: documenting and explaining inequalities in times of socio-economic instability. *Eur J Public Health* 2018;**1**:54-60. doi:10.1093/eurpub/cky202.

77. Bhugra D, Becker MA. Migration, cultural bereavement and cultural identity. *World Psych* 2005;**4**:18-24.

78. Japan approves 126 measures to attract more foreign workers. Nikkei Asian Review. 2018 Dec 25. https://asia.nikkei.com/Spotlight/Japan-Immigration/Japan-approves-126-measures-to-attract-more-foreign-workers

79. Hamai T, Nagata A, Nishikawa H. The need for medical interpreters: a questionnaire survey of municipal hospitals in Japan [in Japanese]. *Jpn J Pub Health* 2017;**64**(11):672-83. doi: 10.11236/jph.64.11_672

80. Leppold C, Ozaki A, Shimada Y, Morita T, Tanimoto T. Defining and Acting on Global Health: The Case of Japan and the Refugee Crisis. *Int J Health Policy Manag* 2016;**5**(8):457-460. doi:10.15171/ijhpm.2016.68

81. European Union. Migrant Health Across Europe. By the Migrant Policy group [Internet]. [updated: 2018 Dec 2; cited 2018 Dec 15]. https://ec.europa.eu/migrant-integration/feature/migrant-health-across-europe

82. Ministry of Justice. Statistics on the Foreigners Registered in Japan. [Updated 2017; cited 2018 Nov 24]. Available from: www.ipss.go.jp/p-info/eps2017/PSJ2017-10.xls

83. Bhopal R, Rafnsson S. Global inequalities in assessment of migrant and ethnic variations in health. *Pub Health* 2012;**126**:241-244. doi: 10.1016/j.puhe.2011.11.016

84. Nikkei Asian Review. Japan enacts divisive foreign worker bill to ease labor shortage. 2018 Dec 8. https://asia.nikkei.com/Spotlight/Japan-Immigration/Japan-enacts-divisive-foreign-worker-bill-to-ease-labor-shortage

85. World Health Organization. Japan: Health System Review [Internet]. [Updated 2018; cited 2018 Nov 25]. Available from: http://apps.who.int/iris/bitstream/handle/10665/259941/9789290226260-eng.pdf;jsessionid=5E8D4C6125118E613132CA81B02306D7?sequence=1

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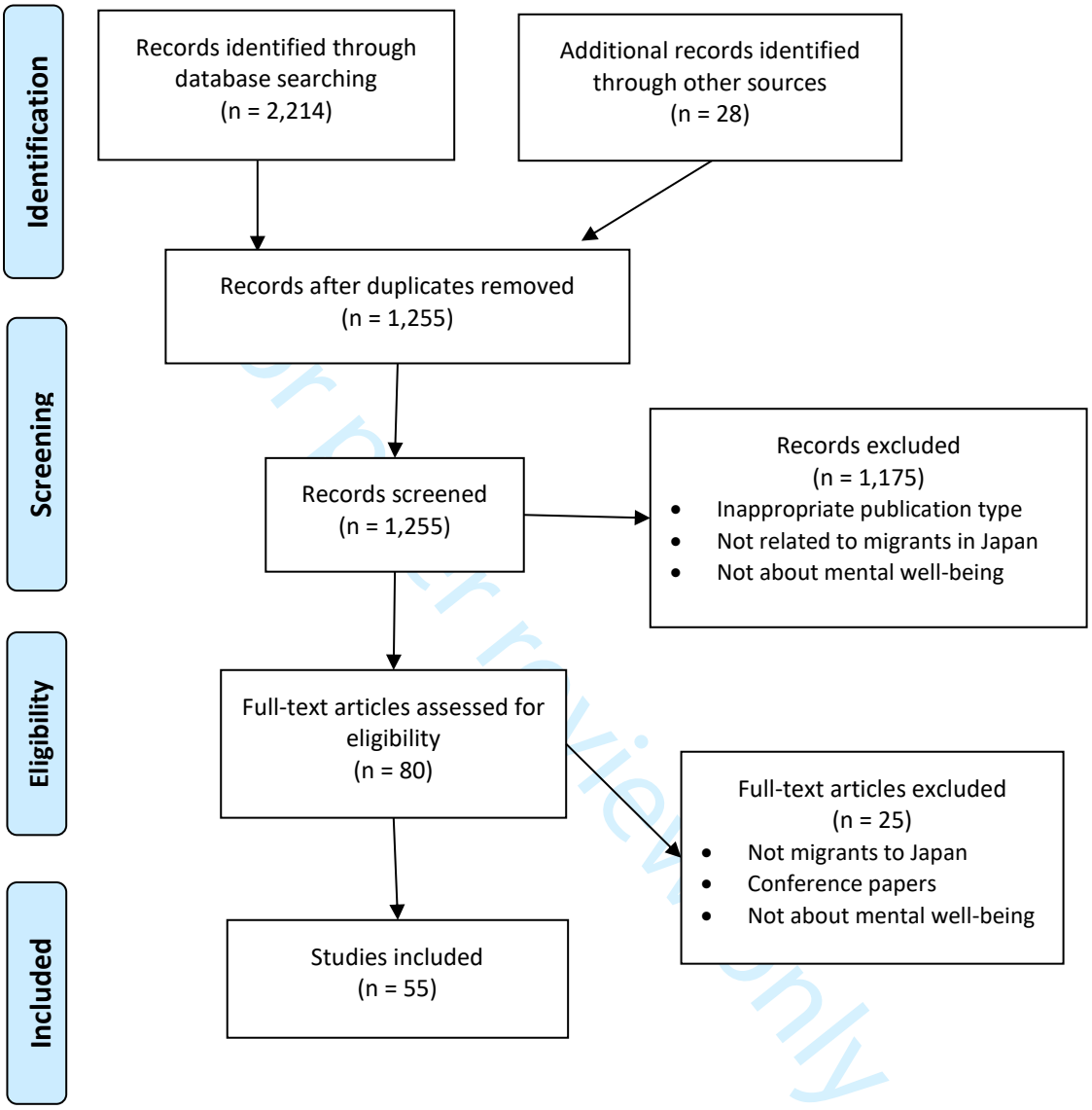

Supplementary Table 1. Extracted Data	Study Characteristics						Factors for Well-being		
Study Abbreviation (*Japanese publication)	**Study Design**	**Study Area**	**Migrant Nationality**	**Number**	**Mental Health Variable**	**Epi Tool**	**Barrier**	**Facilitator**	**Policy recommendation related to international migrants**
Students									
Kakefuda, 2004 * [16]	Cross-sectional, Qualitative	Honshu	Brazilian	66	Adaptation Mental well-being	Questionnaire Interview	Low Japanese language skills, Low support from teachers or parents, Problems with studying	Good communication with Japanese or other Nikkei Brazilians, Having plans for after graduation or future	Creation of a mental health care system for foreign students.
Qu, 2013 [17]	Cross-sectional	Tokyo	Chinese	194	Mental well-being	ECRS GHQ VIA	Attachment Anxiety, Attachment Avoidance, Length of Stay beyond one year	Cultural Identity	Improve intercultural communication between Asian countries to facilitate clinical interventions and prevention programs.
Sun, 2013 [18]	Cross-sectional	Tokyo	Chinese	253	Psychological distress	Questionnaire GHQ-30 AAS TCI	Marginalization (loss of original culture but do identify with new one; a poor acculturation strategy), Harm Avoidance	Social support, Self-directedness	Foster a positive outlook between Japanese culture and Chinese culture; Mass media from both countries should aim to promote mutual understanding and acceptance.
Eskanadrieh, 2012 [19]	Cross-sectional	Sapporo	Chinese (40%) other Asians (32%) South Koreans (14%) non-Asians (14%)	480	Depressive symptoms	Questionnaire CES-D	Female, Masters degree student, Arts students, Self supporting, Living alone	None	Examination of the mental health condition of international students; Japan requires more conclusive evidence for the seriousness of mental health and should take appropriate action.
Murphy-Shigematsu, 2002 [20]	Qualitative	Nonspecific Japan	Unspecified Various	15	Psychological barriers	Counseling Sessions	Unrealistic post-migration expectations, Discrimination, Cross-cultural communication	Coping strategies, Support-seeking, Refocusing of goals	Multicultural training for university staff; Support systems for international students such as pre-departure and post-arrival orientations.
Guo, 2013 [21]	Cross-sectional	Sapporo	Chinese	142	Social capital Mental well-being	Questionnaire ISCS SWLS ASSIS	Dependence on SNS for entertainment, Acculturative stress	Use of SNS for information seeking, Social capital	Further studies on SNS use and acculturation.
Ozeki, 2006 [22]	Cross-sectional	Aomori City	Chinese-speaking (39) English-speaking (32)	71	Transcultural stress	Questionnaire GHQ-30	Finances, Being a Chinese-Speaker	Being an English-speaker	Provide support for Chinese speakers in terms information in native language and adapting to daily life in Japan.
Zheng, 2005 [23]	Cross-sectional	Tokyo	Chinese	161	Psychosocial impact	Questionnaire Open-ended questions	Studying medicine or social sciences; Migration from a SARS affected area of China	More than 1 year of residence; below age 31	Social discrimination against students during disease outbreaks should be minimized; A safe environment should be fostered for their recovery.
Kono, 2014 [24]	Cross-sectional	Sapporo	Chinese (166) South Korean (59) Other Asian (139) Non-Asian (64)	480	Depressive symptoms	Questionnaire CES-D	Lack of scholarship, Poor housing conditions	Sleep quality, Exercise	Authorities should make sure international students can support themselves and maintain their health.
Ma, 2007 * [25]	Cross-sectional	Kanto, Tohoku, Hokkaido	Chinese	267	Mental health status Psychosociological factors	Questionnaire GHQ SDS	Female, Feeling irritated daily, Uneasy characteristics, Low self-esteem	Emotional support network	Improve emotional support networks for international students; Further studies to compare student mental health status in Japan and China.
Matsuda, 2013 [26]	Cross-sectional	Kyushu	Chinese	199	Stress management	Questionnaire DHQ-28	Pre-contemplation and contemplation stage stress management	Maintenance stage stress management, Active practicing stress management behavior	None
Hori, 2012 [27]	Retrospective, Case series	Ibaraki	Asian (66%) Russian (10%) Europian (7%) Latin american and African (5%) mixed	59	Depression, Adjustment disorder, Insomnia, and Schiophrenia	Medical records (diagnosed using ICD-10)	Stresses related to studying, Inter-personal relationship problems, Cultural stress	None	Preparations for emergency consultations by non-Japanese at health centers.

Wang, 2009 * [28]	Cohort study Qualitative	Tokyo, Ibaraki	Chinese	7	Mental stress	GHQ-30 Semi-structured interview	Weak personal relationships, Loneliness, Poor daily life management, Psychosomatic diseases	Comfortable lifestyle, Good relationship with others, Clear aim of studying abroad	Provide guidance for daily life management; Provide information about studying and future; Support the creation of communication networks.
Mizuno, 2000 * [29]	Cross-sectional	Kanto area, Tokai area, Chugoku area	Chinese (159) Korean (59) Taiwanese (46)	264	Mental support Help-seeking behavior	Questionnaire	Concerns about helper responsiveness, Living with spouse	Female, Experience with professional supports	Construct a more effective support system
Workers									
Lee, 2015 * [30]	Cross-sectional Comparative	Tokyo	Korean (66) Chinese (50) other Asian (8) non-Asian (2)	INTL (126) JP (150)	Job stress and mental health	Questionnaire	Overwork, Interpersonal relationship stress	None	A prevention-centered strategy is needed to address job stress.
Asakura, 2008 [31]	Cross-sectional	Northern Kanto	Braziian	313	Psychological symptoms	Questionnaire GHQ-12	Discrimination, Environmental hazards at work, Higher education (low-skill job mismatch), Higher Japanese level (can understand discrimination)	None	To improve the health of migrants: Establish policies and practies designed to decrease ethnic discrimination in the workplace; Improve education about diversity.
Onishi, 2003 [32]	Qualitative	Tokyo	Bangladeshi (13) Pakistani (7) Iranian (4)	24	Coping Strategies for Mental Welll-being	Narrative analysis of Interviews	Percieved low social status, Societal disregard of their socio-economic background, Prejudice	Adapting to and accepting Japanese language and culture, Strong Muslim identity	Develop immigration policies that empower migrants as participants in society and potential Japanese citizens, not only to fill economic needs; Media should create more positive image of non-Japanese; Schools should develop cultural awareness and tolerance for diversity to foster a multi-cultural Japan.
Ohara-Hirano, 2000 [33]	Qualitative	Tokyo	Filipino	265	Stress	Categorization of Interview responses	Worry about sending money home, How family will use such money	Emotional support from family	It is important to consider how a migrant's cultural background informs their adjustment to living in Japan.
Date, 2009 [34]	Cross-sectional	Nagasaki City	Chinese	81	Depressive Symptoms	Questionnaire CES-D	Longer working hours, Age over 30 years	None	Health authorities should consider working time and age as important indicators for reducing depressive symptos among foreign workers.
Ohara-Hirano, 2005 * [35]	Comparative Cross-sectional	Kanto	Filipino	in JPN (265) in KR (401)	Socio-economic strain, Depression	Questionnaire CES-D	Strain about family, Strain about future	None	Consider the background not only the host country but also the labor-exporting country to understand migrant mental health.
Cho, 2005 * [36]	Case series	Japan	Chinese (11) Indonesian (2) Vietnamese (1) Filipino (1)	15	Suicide	Secondary data (JITCO)	Male, Age over 30 years, Shorter stay in Japan (<8 months), Lack of communication	None	With rapid deterioration of mental conditions, the economic burden of foriegn workers and possible feelings of failures should be taken into account; Appropriate psychiatric treatment is then required.
EPA Care Workers									
Ohara-Hirano, 2012 [37]	Cross-sectional	Indonesia	Indonesian	102	Mental Health Status	Questionnaire GHQ	Difficulty bringing family to Japan, Worry about national board examination	Strong motivations for working in Japan	More studies comparing Filipino and Indonesian EPA nurse mental health.
Nugraha, 2016 [38]	Cross-sectional	Japan	Indonesian	92	Mental Health Predictors	Questionnaire GHQ-12 MSPSS SCAS	Female, Feeling skills are underutilized, Fatigue	Social support, Job satisfaction, Socio-cultural adaption, Confident about passing the national board examination	Provide information to prospective care workers about working conditions in mother language to better prepare them physically and mentally for migration to Japan; Long-term follow-up studies are recommended.
Sato, 2016 [39]	Cross-sectional	Japan	Indonesian	71	Mental Health Status	Questionnaire GHQ-28	Female, Having passed the national board certification	Language support, Informational support	Sharing experiences gained by health facilities that have accepted EPA nursing staff previously; Establishment of an ongoing support system aimed at workers who have completed the national qualifications.

Yamamoto, 2018 * [40]	Cross-sectional	Japan	Indonesian (38) Filipino (26) Vietnamese (8)	72	Stress	Questionnaire SOC	Qualitative burden, Physical burden, Confusion about workstyle differences between Japan and the participant's country, Degree of skill utilization, Job suitability	Adjustment to life in Japan, Understanding Japanese language, Satisfaction of work and life, Higher sense of coherence	Consideration of job burden and workplace environment to improve sense of coherence.
Exclusively Women									
Paillard-Borg, 2018 [41]	Qualitative	Tokyo	Fillipino	3	Subjective Well-Being	Focus Group Interview	Japanese language, Isolation from family, Overwork	Religion, Connection with migrant community, Maternal Identity	Support for and education about the health of migrant women.
Shah, 2018 [42]	Cross-sectional	Kanto Area	Nepalese	189	Quality Of Life	Questionnaire WHOQOL-BREF	Differences in medical culture, Unwanted pregnancy, Abortion	Health education	Reproductive health education for migrants.
Mothers									
Martinez, 2017 * [43]	Qualitative	Northern Kanto	Brazilian	18	Mental health	Semi-structured interviews	Pregnancy and child rearing, Anxiety about work and income, Complications due to being a foreigner, Absence of social support	Equal and family connected family, Strength to continue working, Circumstances right conditions to settle down in, Religiousity	Understand the socio-cultural factors affecting the health; Provide intervention that lead pregnant and perperal Brazilian women to have appropriate health behaviors.
Kawasaki, 2014 * [44]	Systematic Review	Japan	Various	Study: INTL (15) JP (18)	Mental health status support	Systematic Review	Cross-cultural conflict, Dilemma, Lack of support, Isolation, Loneliness	None	Immigrant women need access to information and social support services, and help in coping with difficulties as immigrants.
Jin, 2016 [45]	Mixed-method	Kanto	Chinese	22	Depression Stress	Questionnaire EPDS SSS CCS	Unable to follow traditional birthing preparation, low socio-economic status	Social Support	Trascultural healthcare training in Japan, especially on Chinese birthing practices (Zuoyuezi and Yuezican) to reduce cross-cultural stress.
Kita, 2015 [46]	Systematic Review	Japan	Various	Study: INTL (1) JP (35)	Psychological Health	Systematic Review	Anxiety about birth in Japan, Lack of support, Social isolation, Language barrier, Lack of information, Racial discrimination, Limited access to health care, Low socio-economic status	Strengthening social-connectedness	Establishment of multilingual and culture-specific health services, strengthened social and support networks as well as support and political action.
Imai, 2017 [47]	Cross-sectional Comparative	Japan	Chinese (29) Korean (8) Vietnamese (5) Fiipino (5) Mixed	INTL (68) JP (97)	Depressive Symptoms	Questionnaire EPDS SSPS-P	Lack of support from partner or family, Low socio-economic status	None	Medical staff to encourage support from family and provide information about prepatory maternal services
Bunketsu, 2010 * [48]	Cross-sectional	Kanto	Chinese	132	Child-rearing stress	Questionnaire	Time limited due to childcare, Worry about their children after return to China, Difficulties in maintaining work and family balance, Loneliness	Talking with with Chinese friends, Making efforts to change their moods or perception, Patience	For prompt and effective harmonazation with Japanese society, Provide Childcare support with easy-to-use child care facilities, Chance of studing Japanese, Well-baby clinic conducted in Chinese
Shimizu, 2002 * [49]	Cross-sectional Comparative	Kanto, Chubu area	Brazilian (111) Chinese (70) Korean (29)	INTL (210) JP (625)	Parenting stress	Questionnaire	Difficulties with work and child rearing balance, Worry about child characteristics or language ability, Inadequacy of child care environment	Seek help for others	Establish a place to relieve stress speaking native language

Fujiwara, 2007 * [50]	Qualitative	Tokyo	Asian Europian Middle Eastern	9	Loneliness Isolation	Semi-structured interviews	Difficulties in verbal communication, Confusion with Japanese medical culture, Less support	Positive attitude by midwife towards interaction	Provide enough time for caring, Set-up translators or multi-language brochure
General Migrant Populations									
Shakya, 2018 [51]	Cross-sectional	Central Japan	Nepalese	642	Mental Health Status	Questionnaire MSPSS PSS CES-D SCL-90-R	Needing a interpreter during visit to Japanese healthcare facility	Paying health insurance regularly, satisfactory self-rated health, longer stay in Japan	Interventions focusing on reduction of language barrier between migrants and health workers.
Koyama, 2016 [52]	Case Series	Osaka	American (5) Chinese (5) Australian (2) Taiwanese (2) Various	20	Mental Halth Consulation	Medical Records	Cultural differences, Japanese language barriers to describe symptoms	None	Sensitization of health care professionals to transcultural care by facilitating medical professional interpreters and liaison-consulation models. Government should introduce comprehensive social support of non-Japanese people.
Moon, 2007 [53]	Cross-sectional Comparative	Osaka	Korean (204)	KR (204) JP (221)	Subjective well-being	Questionnaire CGA TMIG-IC GDS-15	Korean ethnicity, Absence of sense of purpose of life	None	More pro-active ethnicity-specific support from existing community organiztions and authorities.
Koyama, 2012 [54]	Case Series	Osaka	American (2) Australia (1) New Zealand (1) England (1)	5	Mental Health Consultation	Medical Records SDS STAI	Cultural differences, Japanese language barriers to describe symptoms, Unemployment	None	Promotion of transcultural medical interpreters for psychosomatic medicine and comprehensive social support system for non-Japanese by government.
Ichikawa, 2006 [55]	Cross-sectional	Tokyo Osaka	Afghan	55	Anxiety Depression Posttraumatic Stress	Questionnaire HSCL-25 HTQ	Detention by immigration authorities, Premigration trauma exposure, Living alone	None	Reconsideration of tightening of immigration policies in terms of both health and human rights.
Itoi, 2007 * [56]	Cross-sectional	Kanto	Cambodian	49	Acculturative stress	Questionnaire modified LASC-I	Female, Less education, Fewer Japanese language skills, Shorter length of staying in Japan, Lower occupational status	None	Improve the education systems, Japanese language education, an employment systems, develop a program to promote an education for the people in the host country
Fukaya, 2002 * [57]	Cross-sectional	Kanagawa prefecture	Filipino (43) Nikkei-Brazilian (38) Various	110	Acculturative stress Depressive symptoms	LASC-I CES-D ISEL-S	Less education, Shorter length of stay, Lower social support	Social support	Increase social support for foreign residents.
Ohara-Hirano, 2001 * [58]	Cross-sectional	Kyushu	Filipino (36%) Peruvian (9.4%) Chinese (9.4%) Indonesian (9.0%) Various	280	Depressive symptoms	Questionnaire CES-D	Non-western national origin, Migration to Japan for work or training	Western origin nationality, Migration to Japan for marriage, Living with family	Japanese society needs to set up support systems for finding jobs, improving daily life, and so on.
Lee, 2009 [59]	Cross-sectional Comparative	Japan	North Korean defector	in JP (30) in KR (51) JP (43)	Mental health and Quality of Life	BDI WHOQOL-Bref Semi-Structured Interview	Language fluency, Adopted nationality	Longer length of stay	Better monitoring of pervasive depression among refugees; Consideration of social support system and effective medical interventions for proper adjustment to Japan.
Brazillian 'Nikkeijin'									
Miyasaka, 2007 [60]	Cross-sectional Comparative	Northern Kanto Sao Paulo	Braziian	in BRZ (100) in JP (107)	Mental Health Disorders	Medical Records	Living alone, Staying in Japan for short periods	Living with family, Having a work of friends	Mental heath professionals should encourage building a network of friends and support systems.
Kondo, 2011 [61]	Cross-sectional Comparative	Northern Kanto Sao Paulo	Brazilan	in BRZ (331) in JP (172)	Mental Health Status	SDQ	Adverse circumstances at home and at school while living in Japan	None	Further verification studies.

Asakura, 2006 [62]	Cross-sectional	Northern Kanto	Brazilian	265	Psychological disturbance	Questionnaire GHQ-12	Living alone, Longer stay in Japan, Lower economic status, Migration to Japan due to unsatisfactory socio-economic conditions in Brazil, Severe family life concerns	Moderate Japanese Language Proficiency, Plans to return to Brazil as soon as possible	Provision of more information about Japan life, culture and working conditions prior to migration to form more accuate expectations and help with adjustment through consultation services; Government policy outlining treatment of foriegn workers to stop discrimination and promote equal treatment; Change societal mindset to one of embracing diversity; Opportunites for advancement and job training. NGO and government support services for foreign workers will promote health and assimilation.
Tsuji, 2001 [63]	Cross-sectional	Northern Kanto	Brazilian	40	Mental Health Disorders	Medical Records	More distant descendant of Japanese	Higher Japanese language ability, Living in Japan beyond 5 years	Further studies on mental health of Brazilians.
Miyasaka, 2002 [64]	Cross-sectional Comparative	Northern Kanto	Brazlian	in BRZ (213) in JP (158)	Mental Health Status	Questionnaire SRQ-20	Being female, Being a smoker, Previously being a student in Brazil	None	Authors established a mental health network for Brazilians in Japanese migrant population centers that is proving useful.
Takenoshita, 2015 [65]	Cross-sectional	Northern Kanto	Brazilian	1252	Psychological Well-Being	Secondary Data Questionnaire CES-D	Being Female, Unemployed, Percieved descrimination	Bonding social capital (relatives live nearby nearby)	None
Honda, 2005 * [66]	Cross-sectional	Kanto	Brazilian	150	Mental Illness, Risk Factors	Questionnaire SRQ-20	Living alone, Shorter periods of stay (< 5 years), Previous psychiatric problems, Lower Japanese ability, Culture conflict betweeen Japan and Brazil	None	None
Tsuji, 2000 * [67]	Cross-sectional Comparative	Tochigi Bauru (Brazil)	Brazilian	BRZ (213) JP (157)	Depression	Questionnaire SRQ-20	Female, Under 30 years old, Being a student prior to immigration	None	None
Tsuji, 2002 * [68]	Cross-sectional	Tochigi	Brazilian	151	Depression	Questionnaire SRQ-20	Current findings: Not significant; Findings 2 years previous with same indicators: Female, Youth, Student prior to immigration	Longer staying in Japan (>2 years)	None
Asakura, 2005 * [69]	Cross-sectional	Aichi	Brazilian	112	Psychosomatic distress	Questionnaire	Less time spent with parents, Difficulties in adaptatinng to Japanese customs and social environment, Higher frequency being not understood by parents, Poorer adaption to school	Good relationships with Japanese friends, Good family relationships, More social support, Longer staying in Japan	Health promotion for ethnic minority students.
Otsuka, 2001 * [70]	Cross-sectional	Tochigi	Brazilian	163	Aculturation, Mental Disorders	Questionnaire	Living alone, Poor aculturation, Isolation from society, Low Japanese language skills, Shorter length of stay	Bicultural identity	None

Supplementary Table 2. Study Quality Assessment

Citation	Pre-migration	Post-migration	Non-migrant comparison	Valid measurement	Justification of sample size	Study Quality
Students						
Kakefuda, 2004 * [16]		X		X	X	3
Qu, 2013 [17]		X		X	X	3
Sun, 2013 [18]		X		X	X	3
Eskanadrieh, 2012 [19]		X		X	X	3
Murphy-Shigematsu, 2002 [20]	X	X			X	3
Guo, 2013 [21]		X		X	X	3
Ozeki, 2006 [22]	X	X		X	X	4
Zheng, 2005 [23]		X		X	X	3
Kono, 2014 [24]		X		X	X	3
Ma, 2007 * [25]		X		X	X	3
Matsuda, 2013 [26]		X		X	X	3
Hori, 2012 [27]		X	X	X	X	4
Wang, 2009 * [28]		X		X		2
Mizuno, 2000 * [29]		X		X	X	3
Workers						
Lee, 2015 * [30]	X	X	X	X	X	5
Asakura, 2008 [31]		X		X	X	3
Onishi, 2003 [32]	X	X			X	3
Ohara-Hirano, 2000 [33]		X		X	X	3
Date, 2009 [34]		X		X	X	3
Ohara-Hirano, 2005 * [35]	X	X		X	X	4
Cho, 2005 * [36]		X		X	X	3
EPA Care Workers						
Ohara-Hirano, 2012 [37]	X			X	X	3
Nugraha, 2016 [38]	X	X		X	X	4
Sato, 2016 [39]		X		X	X	3
Yamamoto, 2018 * [40]		X		X	X	3
Exclusively Women						
Paillard-Borg, 2018 [41]	X	X		X		3
Shah, 2018 [42]		X		X	X	4
Mothers						
Martinez, 2017 * [43]		X		X	X	3
Kawasaki, 2014 * [44]		X				1
Jin, 2016 [45]		X		X	X	3
Kita, 2015 [46]		X		X	X	3
Imai, 2017 [47]	X	X	X	X	X	5
Bunketsu, 2010 * [48]		X		X	X	3
Shimizu, 2002 * [49]		X	X	X	X	4
Fujiwara, 2007 * [50]		X		X		2
General Migrant Population						
Shakya, 2018 [51]	X	X		X	X	4
Koyama, 2016 [52]		X		X	X	3
Moon, 2007 [53]		X	X	X	X	4
Koyama, 2012 [54]		X		X		2
Ichikawa, 2006 [55]	X	X		X	X	4
Itoi, 2007 * [56]	X	X		X	X	4
Fukaya, 2002 * [57]		X		X	X	3
Ohara-Hirano, 2001 * [58]	X	X			X	3
Lee, 2009 [59]		X	X	X	X	4
Brazillian 'Nikkeijin'						
Miyasaka, 2007 [60]		X	X	X	X	4
Kondo, 2011 [61]	X	X	X	X	X	4
Asakura, 2006 [62]		X		X	X	3
Tsuji, 2001 [63]	X	X			X	3
Miyasaka, 2002 [64]	X	X	X	X	X	5
Takenoshita, 2015 [65]		X		X	X	3
Honda, 2005 * [66]	X	X		X	X	4
Tsuji, 2000 * [67]		X		X	X	3

Tsuji, 2002 * [68]		X		X	X	3
Asakura, 2005 * [69]	X	X		X	X	4
Otsuka, 2001 * [70]		X		X	X	3

Supplementary Table 3. Epidemological Tool Abbreviations

AAS	Acculturation Attitude Scale
ASSIS	Acculturative Stress Scale for International Students
BDI	Beck Depression Inventory
CCS	Cross-Cultural Stress Scale
CES-D	Center for Epidemiologic Studies Depression
CGA	Comprehensive Geriatric Assessment
ECRS	Experiences in Close Relationship Scale
EPDS	Edinburgh Postnatal Depression Scale
GDS-15	Geriatric Depression Scale
GHQ-30	General Health Questionnaire 30
HSCL-26	Hopkins Symptoms Checklist 25
HTQ	Harvard Trauma Questionnaire
ISCS	Internet Social Capital Scale
ISEL-S	Interpersonal Support Evaluation List Scale
LASC-I	Latin American Stress and Acculturative Stress and Coping Inventory
Medical Records	Retrospectively analyzed patient mental health records
MSPSS	Multidimensional Scale of Perceived Social Support
PSS	Perceived Stress Scale
SCAS	Sociocultural Adaptation Scale
SCL-90-R	Symptoms Checklist-90-Revised
SDQ	Strength and Difficulties Questionnaire
SDS	Self-rating Depression Scale
SOC	Sense Of Coherence
SRQ-20	Self-reporting Questionnaire
SSPS-P	Social Support Perception Scale for Parents Rearing Preschoolers
SSS	Social Support Scale
STAI	State-Trait Anxiety Inventory
SWLS	Satisfaction with Life Scale
TCI	Temperament and Character Inventory
TMIG-IC	Tokyo Metropolitan Institute of Gerontology Index of Competence
VIA	Vancouver Index of Acculturation
WHOQOL-BREF	World Health Organization Quality of Life- Brief Version

PRISMA 2009 Checklist – bmjopen-2019-029988 – Mental Well-Being of International Migrants to Japan: a Systematic Review

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5-6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	6
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6-7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	7-8
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	9
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	9
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	9
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	10
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N/A

PRISMA 2009 Checklist – bmjopen-2019-029988 – Mental Well-Being of International Migrants to Japan: a Systematic Review

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	9
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	10
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	10
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	10-11
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	14
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	11-12
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	14
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	12-13
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	19-20
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	20
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	21

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

PRISMA 2009 Checklist – bmjopen-2019-029988 – Mental Well-Being of International Migrants to Japan: a Systematic Review

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Mental Well-Being of International Migrants to Japan: a Systematic Review

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Mental Well-Being of International Migrants to Japan: a Systematic Review

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Abstract

Background Migration is a stressful process of resettlement and acculturation that can often negatively impact the mental health of migrants. In Japan, international migration is growing steadily amid an aging domestic population experiencing severe labor shortages.

Objectives To identify the contemporary barriers to, and facilitators of, mental well-being among the migrant population in Japan.

Design Systematic review

Data sources PubMed, ProQuest, Web of Science, Ichushi and J-Stage

Eligibility criteria Research articles examining the mental well-being of international migrants in Japan that were published in English or Japanese between January 2000 and September 2018 were included.

Data extraction and synthesis Full-texts of relevant articles were screened and references of the included studies were hand-searched for further admissible articles. Study characteristics, mental well-being facilitators and barriers, as well as policy recommendations were synthesized into categorical observations and were then thematically analyzed.

Results Fifty-five studies (23 published in English), surveying a total of 8,649 migrants, were identified. The most commonly studied migrant nationalities were Brazilian (36%), followed by Chinese (27%) and Filipino (8%). Thematic analysis of barriers to mental well-being among migrants chiefly identified “language difficulties”, “being female” and “lack of social support”, whereas the primary facilitators were “social networks” followed by

"cultural identity". Policy recommendations for authorities included more migrant support services and transcultural awareness among the Japanese public.

Conclusion Access to social support networks of various types appears to be an influential factor affecting the mental well-being of international migrants in Japan. More research is necessary on how to promote such connections to foster a more inclusive and multicultural Japanese society amid rapid demographic change.

PROSPERO registration number CRD42018108421

Keywords: Mental Well-being; Japan; Migration

Article Summary

Strengths and limitations of this study

- Our study is the first to comprehensively screen and synthesizes available research, published both in Japanese and English, on the mental well-being of international migrants to Japan.
- Key findings were extracted and thematically analyzed from relevant studies of diverse migrant populations in Japan evidencing the role of social support networks.
- The cross-sectional nature of the included studies limits the value in supporting causal effects and generalizability.
- While English and Japanese databases were surveyed, grey literature was not comprehensively searched.

Introduction

Global migration has increased markedly in recent decades and international migrants now constitute 3.4% of the global population.[1] International migrants are considered to be "any person who lives temporarily or permanently in a country where he or she was not

born, and has acquired some significant social ties to [their] new location".[2] Therefore migrants include non-indigenous people who are long-term immigrants, organizational expatriates, international students and migrant workers as well as forced migrants such as asylum seekers and refugees. While motivated by push and pull factors based on perceived opportunity, international migration has been well-documented to be a stressful, multi-factorial process that can adversely affect health.[2-4] The 'right to health' of migrants is enshrined in the Declaration of Alma-Ata (1978) and states receiving countries should take a comprehensive approach to health care of such sojourners beyond basic infectious disease control.[5] Accordingly, migration is increasingly recognized as a structural socioeconomic force that influences health outcomes as a social determinant of health, in general, and mental health, in particular.[6, 7]

As the world's third largest economy, Japan was home to 2.2 million international migrants in October 2018. This figure represents about 2% of the national population and approximately 200,000 foreign nationals were newly settled during that year.[8] While the number of foreign residents settling in Japan continues to accelerate, the total population of Japan is predicted to decline by 31% from a peak of 126 million in 2016 to 87 million by 2060.[9] Japan is a harbinger of the future as the first nation in human history to experience population decline due to "super-aging". Other developed nations like Germany and Italy, are on a similar demographic trajectories and such changes will swiftly increase the proportion of comparatively young foreign national populations.[10] However, unlike other developed countries with a history of large-scale, institutional health research that includes

non-citizens,[11] in Japan, mainly exploratory research has been conducted on the health of migrants.

Facing a serious demographic challenge, the Japanese government has begun to publicly acknowledge the need for more foreign workers; however, structural issues continue to perturb the humanistic integration of international migrants. For example, a comprehensive 2017 survey showed that 30% of foreign residents had experienced discrimination in Japan, with 40% having been rebuffed when seeking housing and 25% had been denied a job due to their nationality.[12] Additionally, the Migration Integration Policy Index (MPIX) recently highlighted strict working visa requirements and a culture of overwork and harassment in Japan leading to occupational morbidity;[13] such 'push' factors may impact the positive functioning of migrants as part of Japanese society.

The World Health Organization (WHO) defines mental health as, "a state of well-being where every individual can realize his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community".[14] Mental well-being is a dual continuum that includes mental health and positive functioning open to sociocultural interpretation and includes concepts such as contentment, absence of negative life determinants, absence of disease, or economic prosperity.[14]

Japan as a host nation, has a unique cultural and linguistic context in which the mental well-being and related supports for migrants are likely impacted. To the best of our knowledge, there has been no synthesis of the literature on the mental health or well-being of international migrants to Japan. In order to examine the social determinants of mental

well-being among migrants as barriers to, and facilitators of, this subject was systematically reviewed. Our findings are a timely addition to the growing global health discipline of migrant health and may also provide authorities with an evidence base for further immigration reform and social design.

Methods

Patient and Public Involvement statement

Patients and the public were not involved in the design or planning of this study.

Study description

This systematic review of observational studies was conducted in accordance with the 2009 Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) reporting guidelines.[15] The study protocol was registered at PROSPERO in September 2018 (https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=108421, registration No. CRD42018108421). As primary human health data was not used in this research, ethical approval was not required.

Inclusion and exclusion criteria

Study selection was purposively designed to be broad in order to scope the progress of research assessing a heterogenous health concept in an equally diverse population. *Migrant* was defined in line with the Japanese government guidelines as a foreign national living in Japan for three months or more.[8] Study inclusion criteria were: 1) published research

assessing mental well-being among international migrants in Japan; 2) quantitative and/or qualitative methodologies examining more than one migrant, including systematic reviews; 3) studies published in English or Japanese. Exclusion criteria were 1) conference proceedings, expert opinions, single case reports or reviews; 2) analysis of international tourists, 3) studies published prior to January 2000. Mental well-being (including mental health outcomes such as depression, anxiety, resilience, etc.) must have been assessed using a standardized research method including epidemiological surveys, interviews or medical records.

Search strategy

Electronic databases were searched for publications published between January 2000 and September 2018. Studies published before 2000 were excluded in order to better reflect the demography of contemporary migrant populations in Japan which have changed dramatically over the past two decades. The following databases were queried: PubMed, UTokyo Resource Explorer (UTREE; includes Proquest, SpringerLink, ScienceDirect) and Web of Science; as well as Japanese databases, Igaku-chuo-zasshi (Ichushi; https://search.jamas.or.jp/) and J-STAGE (https://www.jstage.jst.go.jp/), each of which cite over 300,000 articles per year from 2,500 Japanese biomedical journals. The search was completed in September 2018, and the English as well as Japanese search terms are listed in Table 1. Both sets of search terms were used to query each database.

Table 1. Search Terms

English	Japanese
"Mental health" OR "Psychology" OR "Mental well-being" AND	"精神保健" OR "メンタルヘルス" OR "心の健康" OR "精神衛生" AND
"Migrant" OR "Immigrant" OR "Expatriate" OR "Foreigner" OR "Refugee" OR "Foreign resident" OR "International student" AND	"居住者" OR "駐在員" OR "労働者" OR "移住者" OR "難民" OR "留学生" OR " 在留外国人" AND
"Japan"	"在日" OR "日本における外国人" OR "在留"

Selection and retrieval process

Based upon the above selection criteria, two researchers (RM, YT) independently evaluated each title and abstract for inclusion. After removing duplicates, 1,255 compiled titles were screened for relevance to the study topic, then study abstracts were read to confirm relevance. Any ambiguities throughout the selection process were discussed with a third researcher (KICO) and arbitrated through group consensus. After review, all but 80 titles were removed for full text review due to being inappropriate publication type, not on migrants in Japan or not examining an element of mental well-being. Full texts were reviewed to ensure the publications met all inclusion criteria. After this process, the remaining 55 full texts were included in data synthesis. References in these articles were hand-searched revealing 28 potentially useful references. All full texts were located via the University of Tokyo library system or in case of difficult to locate manuscripts, by contacting the first author directly. Figure 1 is a PRISMA flow diagram of our screening process.[15]

Data extraction

A review library of included studies was made of PDF files using Mendeley referencing software. Data were extracted independently into Excel by the primary researchers (RM, YT). Extracted data (Supplementary Table 1) included first author, year of publication, study design, study area (city or region), subject nationality (<four largest groups are specified), number of subjects, mental health variable assessed, epidemiological tool employed, significant barriers as well as facilitators of mental well-being and subsequent policy recommendations. Non-significant factors discussed by the study authors were not included. Strategies and data presentation were discussed by researchers throughout the process to harmonize search and extraction strategies.

Quality/bias assessment

Study quality was assessed during data extraction using five specific criteria appropriate for the heterogeneity of the included studies which were adapted from the main guidelines of the Newcastle Ottawa Quality Assessment Scale for Cohort and Cross-Sectional Studies (NOS): selection, comparability and outcomes (Supplementary Table 2). These criteria were as follows: consideration of pre-migration factors, consideration of post-migration factors; inclusion of a non-migrant comparison group; use of a valid measurement tool; justification of satisfactory sample size. A score of 1–5 were assigned to each study based on these criteria. Publications with scores 1-2 were labelled ‘poor quality’, 3 were considered ‘average quality’ and 4-5 were of ‘good quality’. An experienced third reviewer was consulted (KICO) when assessing quality and potential publication bias.

Data analysis

In total, 55 full articles were included in our analysis. Due to the significant heterogeneity among study themes, populations and methodologies, a thematic synthesis was conducted instead of a meta-analysis. We did not pre-define the way in which the relationships among concepts were evaluated within studies and accepted outcome measures based on the author's qualitative and/or quantitative assessment. Thematic analysis was used to group barriers and facilitators identified by included studies to have a significant association with their respective mental health variable of interest.

Results

Description of studies

In total 55 studies examining the mental well-being of international migrants in Japan were selected for this review (for a detailed selection flowchart see Figure 1). There were 13 studies examining international university students studying in Japan and one of Brazilian middle school students (the youngest cohort assessed in this study).[16-29] Eleven studies exclusively examined migrant workers;[30-36] four studies were on the mental well-being of Economic Partnership Agreement (EPA) care workers specifically [37-40]. Two studies enrolled non-pregnant migrants,[41, 42] and eight exclusively analyzed mothers.[43-50] The remaining nine studies were of general migrant populations of a single (n=5) or various (n=4) nationalities.[51-59] Remarkably, there were ten studies specifically examining

Brazilians of Japanese descent, making them the most studied nation-specific migrant subgrouping in terms of mental well-being.[60-70]

In total, 8,649 migrants were surveyed. This calculation excludes >2,000 migrants reviewed in each of two systematic reviews.[44, 46] All subjects were recruited from the community or retrospectively from clinical records. On average three studies per year (range, 1 to 5) were consistently published on this topic since 2000. Of the included studies, 23 were published in English while the remaining were in Japanese. Their study designs were cross-sectional (n=40; one in four utilizing a comparative population), qualitative (n=7), case series (n=3), mixed methods (n=3) and systematic review (n=2). Most studies were conducted in specific major metropolitan areas, such as Tokyo, Osaka, Sapporo, etc. As study location was sometimes anonymized, it was inferred that almost all studies were completed within central Japan in an urban setting. The number of subjects per study ranged from 3–1,252, with a median size of 119. Importantly, a small number of migrants (<75) were explicitly not enrolled in a health insurance plan; the only studies that listed this variable were those of Nepalese[51] or Brazilians migrants.[60-70]

Sample nationalities

Of the migrants surveyed, 36% were Brazilian, 27% Chinese and 8% Filipino. Each nationality was exclusively studied in 14, 10, and 3 publications, respectively. The remaining 28 studies examined a mixed international migrant population. The four most numerous nationalities from each report were specifically extracted from a heterogeneous

sample population, any remaining nationalities were identified as 'various' in Supplementary Table 1.

Mental health variables and tools

Almost every observational study employed some unvalidated survey questions in addition to at least one previously validated survey tool (in part or whole). Non-validated questions were marked as a 'questionnaire' tool in Supplementary Table 1. Additionally, 33 epidemiological tools used to measure mental well-being are noted, with an abbreviation legend in Supplementary Table 3.

Thematic analysis

More barriers than facilitators to mental well-being were cited among the included studies and multiple themes were often described in a single study.

Barriers

Among the included studies, the most common barrier was trouble communicating in Japanese as 10 studies described such difficulty as negatively impacting mental health. These studies cited language barriers creating stress of managing daily life or trouble describing symptoms in a medical environment. The next most common barrier was a lack of support, either from teachers,[16] employers,[31, 40] family,[45] or healthcare professionals.[43, 44] These findings were very similar to a described lack of social networks (isolation or living alone) described in 11 studies. The third most common barrier

to mental well-being was 'being female' cited in nine studies. Nine studies also mentioned various sources of stress, like acculturation,[17] child-rearing,[43] or finances.[24] Occupational stress,[30, 31, 38, 40] and discrimination [20, 23, 31, 46] were each mentioned in four studies along with age over 30 years,[34, 36] and living in Japan for more than one year,[17, 62] each described in two studies.

Facilitators

Social and support networks were found to be robust facilitators of mental well-being. These two concepts were mentioned 25 times as statistically significant outcomes. Some examples of such support included in study, job or daily life,[18, 38] living with family versus living alone,[43, 60] connecting with friends,[48, 69] or maintaining connections with the migrant community.[41] Occupational factors such as job satisfaction were noted nine times. Facilitators mentioned four times or fewer included: strong cultural identity, cultural adaptability, longer stay in Japan, coping skills, age under 30 years and Japanese fluency. Remarkably, 'being female' was also found to be a facilitator in one study.

Policy Recommendations

Two themes among policy recommendations were identified: calls for the creation of various support systems targeted at the migrant population by the government and calls for transcultural education of the public about migrants. Proposed support systems were medical (n=15), educational (n=7), occupational (n=3) and general (n=10). The types of

transcultural education authors described included fostering awareness of migrant cultural backgrounds and promoting a positive image of international migrants in mass media.

Quality/bias of studies

Seventeen studies were found to be of high quality according to our criteria, while 33 were of average quality. This difference was due primarily to a failure to examine pre-migratory factors or employ a comparison group. Only four studies were considered of low quality and potentially biasing mainly due to their unjustified small sample size.[28, 44, 50, 54] Publication bias was assessed in cases of multiple publication or publishing in a suspected predatory journal; two studies were excluded for these reasons during review.

Discussion

Overall a complex picture of this heterogeneous migrant population and factors impacting their mental well-being emerged from this systematic review. Thematic analysis demonstrated the access to social support to be the most common determinant (barrier to or facilitator of) mental well-being among international migrants in Japan. Several other factors such as discrimination language skills and length of stay were also found to impact their mental well-being. Based on these findings, researchers often called for the creation of more migrant-focused support programs and transcultural training for the Japanese public to reduce such health gaps.

Psychosomatic symptoms, such as depression, among other mental disruptions were found to be significantly associated with a lack of support. For example, in a few studies

those without social support were reluctant to seek medical consultation perhaps due to language barriers or without encouragement from others.[46] Additionally, stress was reported to originate from many sources including: study,[27] child rearing,[48] family,[45] occupation,[46] and cultural adjustment.[18, 58, 66] When migration examined more broadly as a social determinant of health has been shown to lead to isolation and distress if there is a deficiency in social connection in a post-migratory setting.[71] Taken together, evidence from Japan suggests there is need for research into how migrants can identify social networks to support themselves as well as how host societies can foster such opportunities for migrants.

Several included studies found that living in Japan for short periods was a barrier to mental well-being while longer stays were facilitators. For example, Brazilians living in Japan for limited periods for work were found to have a higher prevalence of mental disorders.[60, 66, 70] On the other hand, a study by Tsuda *et al.* showed that Brazilians living in Japan for more than 5 years had fewer mental disorders.[63] In the assimilation theory of migration the length of residence in a host country and degree of proficiency in the host language also believed to positively influence the acculturation process within the first year of migration when there are more mental disturbances due to culture shock and changes in daily life.[72] Visa status or stability were not mentioned as a significant factor for mental well-being even among studies including subjects with a variety of visas; broader comparative studies of this topic may be warranted.

Contrastingly, studies by Qu *et al.* and Tsuji *et al.* found longer stays to be associated with worse well-being among different migrant populations.[17, 68] These

findings support the cumulative disadvantage theory, which runs counter to the assimilation theory by suggesting that health-related disadvantages, such as persistent transcultural distress, increase with prolonged length of residence in a receiving country.[72] While length of stay was often protective to migrant mental health in aggregate, similar to our results, a previous systematic reviews of migrant health also found such findings varied between migrant surveys in Canada.[73]

Discrimination has been well-studied as part of the migrant experience.[74] Similarly, it was noted to be a factor associated with poorer mental well-being in several studies of various types of migrants in this study.[20, 23, 31, 46] For example, two studies of this population diverged as to whether the loss or maintenance of Chinese cultural identity are facilitators of mental well-being but both maintain Japanese society does not include them causing mental harm the longer they live in Japan.[17, 18] Interestingly, Asakura *et al.* reasoned that Brazilians workers with Japanese language skills experienced discrimination because these workers could comprehend their status as an outsider in Japanese society more clearly.[31] Examination of discrimination among skilled workers versus unskilled workers in Japan has also shown similar findings.[75]

The female gender and religiosity were found to be a barrier and facilitators of mental well-being, respectively. Ten studies concluded being female was a barrier to mental well-being; only one study suggested the female sex to be a facilitator of mental well-being.[29] This outlier assessed support-seeking behaviors among students, perhaps suggesting that while female migrants to Japan experience more barriers to mental well-being, they are more likely to reach out for solutions than males; as has been shown

previously in other immigrant populations.[71] Previous migration studies have noted that female migrants experience significantly poorer mental well-being than the indigenous population.[76] Additionally, several studies on Filipino, Brazilian and Muslim migrants established religiosity as a strong facilitator of mental well-being.[32, 41, 43] Cultural identity and religiosity as facilitators of mental well-being are consistent with previous research on cultural identity and religious beliefs among migrants.[77]

Most of the studies surveyed in this review had general recommendations for the Japanese government, health authorities or society at large. As might be expected, the most discussed recommendation was the implementation of various support systems ranging from Japanese language education, medical systems and personal support networks. Such supports, like the provision of translated information and consultation desks, may address barriers for migrants; encouragingly local authorities have or are planning to implement many such mechanisms.[78] Notably absent from such government-backed systems, however, is support for a comprehensive medical interpretation system for healthcare institutions.[79]

A more novel suggestion raised by fewer publications was the importance of transcultural education about diversity or appreciation of different cultural backgrounds. This due in part to generalization on the part of mass media and a general lack of awareness among the domestic population as the Japanese the word *imin*, immigrant, is generally only applied to low-skilled workers.[80] For example, representative studies called for a more positive characterization of migrants by the mass media while other authors stressed the importance of transcultural competence both in the workplace and medical centers by

domestic staff.[18, 55] More research about diversity education in Japan may help to address the social determinants of migrant mental health.

Robust sampling in migration research is understood to be difficult because migrant populations are inherently mobile and often prefer to remain unidentified; thus, migrant research is chronically underfunded as research agencies are reluctant to award grants where rigorous methodology does not exist.[3] Most studies on migrant mental well-being in Japan were community-based and used convenience or snowball sampling. Unsurprisingly, study populations were small, as half of studies enrolled less than 119 participants and only one publication included explicit sample size calculations.[64] The study with by far the largest sample size, utilized government survey records from Hamamatsu, Ibaraki Prefecture, to study the social connectedness of 1,252 Brazilians migrants.[65] There were also four retrospective surveys of institutional medical records over several years identified by our study.[27, 52, 54, 60] Taking into account the difficulty of sampling, samples were viewed as often justifiable to measure specific communities but representative cross-sections of entire migrant populations. In contrast, in their systematic review of immigrant women in the perinatal period, Kita *et al.* surveyed more than ten studies with large samples sizes that reviewed Japanese medical or governmental records.[46] Improving the rigor in migrant health research in Japan will, require more analyses of health records and secondary analysis of government administered surveys like the large-scale surveys including migrants that are regularly carried out in the European Union.[81]

Next, the representativeness of migrant sampling, in terms of proportionality to the

foreign community in Japan, was found to be skewed. The most populous migrant populations represented in our study were Brazilian (37%), Chinese (27%), Filipino (8%) and Korean (4%). It seems that Brazilian migrants and students, particularly Chinese students, have received more research attention in Japan. In reality, according to the Ministry of Justice, the four most populous migrant nationalities as of 2018, in descending order, were Chinese (29%), Korean (18%), Vietnamese (10%) and Filipino (10%).[82] The Nepalese and Vietnamese populations in Japan have exploded since 2015,[8] and related research is only just appearing in the literature. Such research biases are remarkable and may carry across migrant studies in Japan and should be addressed for accurate scoping of migrant health.[83]

Migrants to Japan are relatively understudied compared to migrants in other high-income countries, especially in terms of mental health status. While the may be due to their comparatively low proportion (>12% in both Germany and UK), Japanese society is at a critical juncture with new visa categories launched in April 2019 dramatically increasing the number of foreign workers.[84] Key health policy documents, such as the WHO Japan Health System Review, discuss health equity in depth but still only mention migrant health in passing.[85] As it becomes clear that Japan perhaps needs international migrants perhaps more than the reverse, questions remain about whether Japanese social leaders are prepared to facilitate positive mental well-being to create a flourishing society together with migrants regardless of nationality and socioeconomic status.

There are limitations to this systematic review that should be noted. Most of the studies reviewed were cross-sectional and therefore could only describe correlation and not

causation so the strength of actionable conclusions may be impacted. As a narrative approach was taken to data synthesis, all studies were given an equal weight regardless of size, level of significance and quality which could have given undue influence on the findings of four included studies of lower quality. Heterogeneity testing or subgroup analysis of the surveyed literature were not done as part of a meta-analysis leaving the study qualitative in nature. Additionally, grey literature was not assessed, potentially leaving out valuable findings on this topic. The strengths of this systematic review are its comprehensive nature in terms of search strategy and data analysis as well as examining publications published in Japanese. In this way readers can better understand the diversity of the foreign resident population of Japan from the prospective of mental well-being.

Conclusion

The evidence gathered in this systematic review suggests the presence or absence of social support networks for migrants is the main determinant of mental well-being among foreign nationals living in Japan. While promotion of such ties is appropriate, the importance of promoting diversity awareness among healthcare professionals and society-at-large may be under-appreciated. Taken together, our results show that the mental well-being of migrants in Japan requires more investigation about how to best support the integration of international migrants in Japan to actionable government policy.

Figure Legend

Figure 1. Flow diagram of studies that were identified using the search terms and strategy, articles screened for eligibility, included/excluded with reasons, following PRISMA guidelines.

Table 1. Search terms used during systematic review of the literature.

Supplementary Table 1. Study characteristics and mental well-being factors extracted from the reviewed studies.

Supplementary Table 2. Quality assessment of the reviewed studies based on the core principles of the Newcastle Ottawa Quality Assessment Scale for Cohort and Cross-Sectional Studies (NOS): selection, comparability and outcomes.

Supplementary Table 3. List of abbreviations for epidemiological tools employed in the reviewed studies.

Footnotes

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References

1. United Nations Educational, Scientific and Cultural Organization. Migrant/Migration [Internet]. [Updated 2016; cited 2018 Sept 1]. Available from: http://www.unesco.org/new/en/social-and-human-sciences/themes/international-migration/glossary/migrant/
2. Abubakar I, Aldridge RW, Devakumar D, et al. The UCL–Lancet Commission on Migration and Health: the health of a world on the move. Lancet 2018;**392**:2606-54.
3. Renzaho AM. *Globalisation, migration and health: Challenges and opportunities.* 1st ed. London: Imperial College Press. 2016.
4. Virupaksha HG, Kumar A, Nirmala BP. Migration and mental health: An interface. *J Natural Sci Bio Med* 2014;**5**:233. doi: 10.4103/0976-9668.136141
5. International Organization for Migration. World Migration Report 2018 [Internet]. [Updated 2018; cited 2018 Dec 3]. Available from: https://www.iom.int/wmr/world-migration-report-2018
6. Castañeda H, Holmes S, Madrigal D, et al. Immigration as a Social Determinant of Health. *Ann Rev Pub Health* 2015;**36**:375-392. doi:10.1146/annurev-publhealth-032013-182419
7. Salami B, Yaskina M, Hegadoren K, et al. Migration and social determinants of mental health: Results from the Canadian Health Measures Survey. *Can J Pub Health* 2017;**108**:e362-e367. doi:10.17269/cjph.108.6105

8. Ministry of Justice. Foreign National Residents by Nationality [Internet]. [Updated 2019; cited 2 February 2019]. Available from: http://www.stat.go.jp/english/data/nenkan/68nenkan/1431-02.html
9. Ministry of Internal Affairs and Communications, Statistics Bureau. Future Population (2016 to 2110) [XLS]. [Updated 2017; cited 2018 Dec 15]. Available from: http://www.stat.go.jp/english/data/jinsui/2.html
10. Parsons AJQ, Gilmour S. An evaluation of fertility- and migration-based policy responses to Japan's ageing population. *PLoS One* 2018;**13**:e0209285. doi:10.1371/journal.pone.0209285.
11. Eikemo TA, Bambra C, Huijts T, Fitzgerald R. The First Pan-European Sociological Health Inequalities Survey of the General Population: The European Social Survey Rotating Module on the Social Determinants of Health, *Euro Socio Rev* 2017;**33**:137–153.
12. Ministry of Justice. Analytical Report of the Foreign Residents Survey -Revised Edition-. [Updated 2017; Accessed 2018 Dec 25]. Available from: http://www.moj.go.jp/content/001249011.pdf.
13. Migration Integration Policy Index. Japan: Key Findings [Internet]. [Updated 2015; cited: 2019 Jan 1]. Available from: http://www.mipex.eu/japan
14. World Health Organization. Mental health: a state of well-being [Internet]. [Updated 2014, cited 2018 Sept 1]. Available from: http://who.int/features/factfiles/mental_health/en/

15. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med **6**(7): e1000097. doi:10.1371/journal.pmed1000097

16. Kakefuda A. A study into mental health of Japanese-Brazilian students [in Japanese]. J *Psyche, Cult* 2004;**3**:67-72.

17. Qu X, Li L. Attachment, Acculturation and GHQ-30 of Chinese Students in Japan. *Psychol Stud* 2013 **59**:145-150. doi:10.1007/s12646-013-0192-z

18. Sun Y. Chinese students in Japan: The mediator and the moderator between their personality and mental health. *Int J Psychol* 2013;**48**:215-223. doi:10.1080/00207594.2011.648942

19. Eskanadrieh S, Liu Y, Yamashina H, et al. Depressive symptoms among international university students in northern Japan: Prevalence and associated factors [in Japanese]. *Int Health* 2012;**27**:165-170.

20. Murphy-Shigematsu S. Psychological barriers for international students in Japan. *Int J Adv Couns* 2002;**24**:19-30. doi:10.1023/A:1015076202649

21. Guo Y, Li Y, Ito N. Exploring the Predicted Effect of Social Networking Site Use on Perceived Social Capital and Psychological Well-Being of Chinese International Students in Japan. *Cyberpsychol, Behav Soc Net* 2013;**1**:1-7. doi:10.1089/cyber.2012.0537

22. Ozeki N, Knowles A, Ushijima H, Asada Y. Analysis of transcultural stress factors and the mental well-being of foreign Chinese-speaking students in Aomori. *J Aomori U. Health Welf* 2006;**7**(1):8-16.

23. Zheng G, Jimba M, Wakai S. Exploratory Study on Psychosocial Impact of the Severe Acute Respiratory Syndrome (SARS) Outbreak on Chinese Students Living in Japan. *Asia Pac J Pub Health* 2005;**17**(2):124-129.

24. Kono K, Eskandarieh S, Obayashi Y, Arai A, Tamashiro H. Mental Health and Its Associated Variables Among International Students at a Japanese University: With Special Reference to Their Financial Status. *J Immigr Minor Health* 2014;**17**(6):1654-1659. doi:10.1007/s10903-014-0100-1

25. Ma B. The relationship between mental health status and psychosociological factors among Chinese postgraduate students in Japan [in Japanese]. *Juntendo Med J*.2007;**53**:200-210.

26. Matsuda T, Tsuda A, Deng K. Relationship between Stage of Change for Stress Management Behavior and Mental Health among Chinese International Students in Japan. *Kurume U Psychol Res* 2013;**12**:44-49.

27. Hori T, Tachikawa H, Ishi T, et al. An Analysis of Mental Disorders of International Students Visiting the Mental Health Service at Tsukuba University Health Center. [in Japanese]. *Psych Neuro Jpn* 2012;**114**:3-12.

28. Wang F, Kyoko Y. Chinese self-sponsored overseas students' change tendency in mental health and relevant reasons [in Japanese]. *Psychol Rep Sophia U* 2009;**33**:109-125.

29. Mizuno H, Toshinori I. Relation of Sociological and Psychological Factors to Preferences Among Professional Helpers by Asian International Students in Japan [Japanese]. *Japanese J Educ Psychol* 2000;**48**:165-173.

30. Lee G. Job stress and mental health among high-skilled foreign workers (HFWs) in Japan: Comparative analysis between HFWs and Japanese workers [in Japanese]. *Stress Sci Res* 2015;**30**:90-101.

31. Asakura T, Gee GC, Nakayama K, Niwa S. Returning to the "Homeland": Work-Related Ethnic Discrimination and the Health of Japanese Brazilians In Japan. *Am J Public Health* 2008;**98**:743-750. doi:10.2105/AJPH.2007.117309

32. Onishi A, Murphy-Shigematsu S. Identity narratives of Muslim foreign workers in Japan. *J Community Appl Soc Psychol* 2003;**13**:224-239. doi:10.1002/casp.715

33. Ohara-Hirano Y. Cognitive Life Strains and Family Relationships of Filipino Migrant Workers in Japan. *Asian Pacific Migr J* 2000;**9**:365-374.

34. Date Y, Abe Y, Aoyagi K, et al. Depressive Symptoms in Chinese Factory Workers in Nagasaki, Japan. *Ind Health* 2009;**47**:376-382. doi:10.2486/indhealth.47.376

35. Ohara-Hirano Y. The Implication of Socio-economic Strain in Depression of Overseas Filipino Workers [in Japanese]. *Jpn Bulli Soc Psychiat* 2005;**14**:134-145.

36. Cho Y. Suicide prevention for foreign workers and trainees [in Japanese]. *Jpn J of Occup Ment Health* 2005;**13**(1):4-15.

37. Ohara-Hirano Y. The Mental Health Status of Indonesian Candidates Leaving for Japan under the Japan – Indonesia Economic Partnership Agreement : After the Great East Japan. *Int J Jpn Sociol* 2012;**21**:37-45. doi:10.1111/j.1475-6781.2012.01163.x

38. Nugraha S, Ohara-Hirano Y. The Mental Health Predictors of Indonesian EPA Nurses and Certified Care Worker Candidates in Japan 1. *Jpn Psychol Res* 2018;**58**:85-96. doi:10.1111/jpr.12100

39. Sato F, Hayakawa K, Kamide K. Investigation of mental health in Indonesian health workers immigrating to Japan under the Economic Partnership Agreement. *Nurs Health Sci* 2016;**18**:342-349. doi:10.1111/nhs.12275

40. Yamamoto T, Mizukami K. Occupational Stress among Nurses Working in Japan Through the Economic Partnership Agreement (EPA) [in Japanese]. *J Gen Fam Med* 2018;**41**(2):38-44.

41. Paillard-Borg S, Hallberg D. The Other Side of the Mirror : An Analytic Journalistic Approach to the Subjective Well-Being of Filipino Women Migrant Workers in Japan. *SAGE Open* 2018;**8**(1):0-10. doi:10.1177/2158244018757288

42. Shah R, Kiriya J, Shibanuma A, Jimba M. Use of modern contraceptive methods and its association with QOL among Nepalese female migrants living in Japan. *PLoS One* 2018;**13**:e0197243. doi:10.1371/journal.pone.0197243

43. Martinez M, Hatashita H, Suzuki H, et al. Socio-cultural Factors Affecting the Health of Pregnant and Puerperal Brazilian Women in Japan [in Japanese]. *J Int Heal* 2017;**32**:69-81.

44. Kawasaki C. Birth and Child-rearing Experiences of Immigrant Women in Japan and Their Support Needs: A Literature Review [in Japanese]. *Jpn Community Health Nurs* 2014;**16**:90-97.

45. Jin Q, Mori E, Sakajo A. Risk factors, cross-cultural stressors and postpartum depression among immigrant Chinese women in. *Int J Nurs Pract* 2016;**22**:38-47. doi:10.1111/ijn.12438

46. Kita S, Minatani M, Hikita N, Matsuzaki M, Shirashi M, Haruna M. A Systematic Review of the Physical, Mental, Social, and Economic Problems of Immigrant Women in the Perinatal Period in Japan. *J Immigr Minor Health* 2015;**17**:1863-1881. doi:10.1007/s10903-015-0192-2

47. Imai S, Kita S, Tobe H, Watanabe M, Nishizono-Maher A, Kamibeppu K. Postpartum depressive symptoms and their association with social support among foreign mothers in Japan at 3 to 4 months postpartum. *Int J Nurs Pract* 2017;**23**:1-9. doi:10.1111/ijn.12570

48. Bunketsu Y, Emori Y. Parenting stress of Chinese mothers living in Japan. [in Japanese]. *J Gen Fam Med* 2010;**33**:101-109.

49. Shimizu Y. Korean, Chinese, Brazilian mothers' child rearing stress in Japan. [in Japanese]. *Jpn J Matern Health* 2002;**43**:530-540.

50. Fujiwara Y, Horiuchi S. Immigrant women giving birth in Japan: Experience of loneliness and isolation [in Japanese]. *J Hum Care Stud* 2007;**8**:38-50.

51. Shakya P, Tanaka M, Shibanuma A, et al. Nepalese migrants in Japan : What is holding them back in getting access to healthcare ? *PLoS One* 2018;**13**:e0203645.

52. Koyama A, Okumi H, Matsuoka H, et al. The physical and psychological problems of immigrants to Japan who require psychosomatic care: A retrospective

observational study. *Biopsychosoc Med* 2016;**10**:35-37. doi:10.1186/s13030-016-0052-x

53. Moon J, Mikami H. Difference in subjective well-being between ethnic Korean and Japanese elderly residents in an urban community in Japan. *Geriatr Gerontol Int* 2007;**7**:371-379. doi:10.1111/j.1447-0594.2007.00427.x

54. Koyama A, Niki M, Matsuoka H, et al. Psychological Problems for Non-Japanese Speaking Patients in Japan. *J Travel Med* 2012;**19**:324-326. doi:10.1111/j.1708-8305.2012.00645.x

55. Ichikawa M, Nakahara S, Wakai S. Effect of Post-Migration Detention on Mental Health Among Afghan Asylum Seekers in Japan. *Aust New Zeal J Psychiatry* 2006;**40**:341-346. doi:10.1080/j.1440-1614.2006.01800.x

56. Itoi Y. Acculturative Stress Among Cambodian Living in Japan [in Japanese]. *Jpn J Hum Sci Health-Soc Serv* 2007;**35**:51-58.

57. Fukaya H. Acculturative stress and depression among foreigners in Japan [in Japanese]. *Jpn Bull Soc Psychiat* 2002;**11**:11-19.

58. Ohara-Hirano Y. Study on Depression Experienced by Foreign Residents in Kyushu Area [in Japanese]. *Mem Kyushu U Sch Heal Sci* 2001;**28**:129-137. doi:10.15017/305

59. Lee CH, Min SK, Jeon WT, Kigawa M, Sugawara M. Mental health and quality of life of North Korean defectors living in Japan. *Asian J Psychiatr* 2009;**2**:95-99. doi:10.1016/j.ajp.2009.07.001

60. Miyasaka LS, Canasiro S, Abe Y, et al. Migration and mental health: Japanese Brazilians in Japan and in Brazil. *J Bras Psiquiatr* 2007;**56**:48-52.

61. Kondo S, Otsuka K, Sawaguchi GT, et al. Mental health status of Japanese-Brazilian children in Japan and Brazil. *Psychiatry Clin Neurosci* 2011;**65**:226-232. doi:10.1111/j.1440-1819.2011.02202.x

62. Asakura T, Murata AK. Demography, Immigration Background, Difficulties with Living in Japan , and Psychological Distress among Japanese Brazilians in Japan. *J Immigr Heal* 2006;**8**:325-338. doi:10.1007/s10903-006-9003-0

63. Tsuji K, Miyasaka LS, Otsuka K, Honda G, Kato S, Abe Y. Panic disorder cases in Japanese-Brazilians in Japan : Their ethnic and cultural confusion. *Psychiatry Clin Neurosci* 2001;**55**:127-130.

64. Miyasaka LS, Otsuka K, Tsuji K, et al. Mental health of two communities of Japanese- Brazilians : A comparative study in Japan and in Brazil. *Psychiatry Clin Neurosci* 2002;**56**:55-64.

65. Takenoshita H. Social Capital and Mental Health among Brazilian Immigrants in Japan. *Int J Japanese Sociol* 2015;**24**(1):48-64. doi:10.1111/ijjs.12036

66. Honda G, Otuka K, Kuniaki Y, Tsuji K, Abe Y. Psycho-social risk factors for mental disorder among Japanese-Brazilian in Japan [in Japanese]. *Jpn Bull Soc Psychiat* 2005;**14**:45-54.

67. Tsuji K, Miyasaka L, Otsuka K. Depression among immigrants to Japan - A mental health survey of Japanese-Brazilians [in Japanese]. *Jpn Bull Soc Psychiat* 2000;**9**(2):163-170.

68. Tsuji K, Miyasaka L, Otsuka K, et al. Influence of relationship between duration of residence in Japan and degree of adaptation on the mental health status of Japanese-Brazilian immigrants [in Japanese]. *Jpn Bull Soc Psychiat.* 2002;**10**(3):253-260.
69. Asakura T. The Association between Acculturation to Japan Life and Psycho-Somatic Distress among Japanese-Brazilian Students [in Japanese]. *Jpn J Sch Heal.* 2005;**46**(1):628-647.
70. Otsuka K, Miyasaka L, Honda G, Yamaga K, Kato S, Nakamura Y. Cultural adaptation and mental health among Brazilians of Japanese descent living in Japan [in Japanese]. *Jpn Bull Soc Psychiat.* 2001;**10**:149-158.
71. Salinero-Fort MÁ, del Otero-Sanz L, Martín-Madrazo C, et al. The relationship between social support and self-reported health status in immigrants: an adjusted analysis in the Madrid Cross Sectional Study. *BMC Fam Pract* 2011;**12**:46.
72. Dhadda A, Greene G. 'The Healthy Migrant Effect' for Mental Health in England: Propensity-score Matched Analysis Using the EMPIRIC Survey. *J Immigr Minor Health* 2017;**20**:799-808. doi: 10.1007/s10903-017-0570-z
73. Vang Z, Sigouin J, Flenon A. The Healthy Immigrant Effect in Canada: A Systematic Review. *Population Change and Lifecourse Strategic Knowledge Cluster Discussion Paper Series/ Un Réseau stratégique de connaissances Changements de population et parcours de vie Document de travail.* 2015;**3**:1-41.
74. Ibañez GE, Dillon F, Sanchez M, et al. Changes in Family Cohesion and Acculturative Stress among Recent Latino Immigrants. *J Ethn Cult Divers Soc Work* 2015;**24**:219-234. doi: 10.1080/15313204.2014.991979

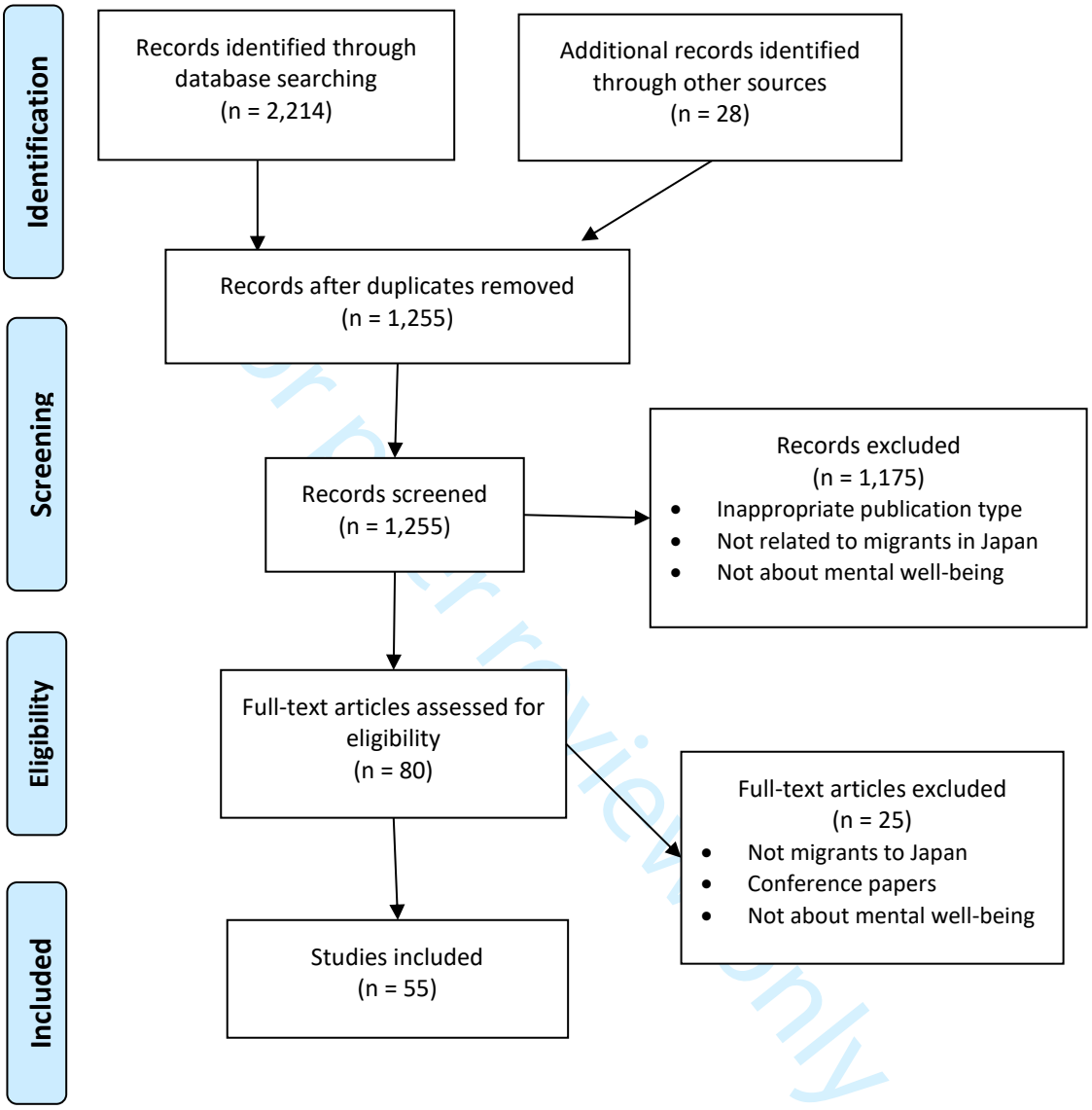
673 75. Shun G. Are the Consequences of Experiencing Discrimination the same for
674 Immigrants of Differing Socio-Economic Status In Japan? *Int Migr* 2017;**56**. doi:
675 10.1111/imig.12370
676 76. Depressive symptoms among migrants and non-migrants in Europe: documenting
677 and explaining inequalities in times of socio-economic instability. *Eur J Public*
678 *Health* 2018;**1**:54-60. doi:10.1093/eurpub/cky202.
679 77. Bhugra D, Becker MA. Migration, cultural bereavement and cultural identity. *World*
680 *Psych* 2005;**4**:18-24.
681 78. Japan approves 126 measures to attract more foreign workers. Nikkei Asian
682 Review. 2018 Dec 25. https://asia.nikkei.com/Spotlight/Japan-Immigration/Japan-
683 approves-126-measures-to-attract-more-foreign-workers
684 79. Hamai T, Nagata A, Nishikawa H. The need for medical interpreters: a
685 questionnaire survey of municipal hospitals in Japan [in Japanese]. *Jpn J Pub*
686 *Health* 2017;**64**(11):672-83. doi: 10.11236/jph.64.11_672
687 80. Leppold C, Ozaki A, Shimada Y, Morita T, Tanimoto T. Defining and Acting on
688 Global Health: The Case of Japan and the Refugee Crisis. *Int J Health Policy*
689 *Manag* 2016;**5**(8):457-460. doi:10.15171/ijhpm.2016.68
690 81. European Union. Migrant Health Across Europe. By the Migrant Policy group
691 [Internet]. [updated: 2018 Dec 2; cited 2018 Dec 15]. https://ec.europa.eu/migrant-
692 integration/feature/migrant-health-across-europe

82. Ministry of Justice. Statistics on the Foreigners Registered in Japan. [Updated 2017; cited 2018 Nov 24]. Available from: www.ipss.go.jp/p-info/eps2017/PSJ2017-10.xls

83. Bhopal R, Rafnsson S. Global inequalities in assessment of migrant and ethnic variations in health. *Pub Health* 2012;**126**:241-244. doi: 10.1016/j.puhe.2011.11.016

84. Nikkei Asian Review. Japan enacts divisive foreign worker bill to ease labor shortage. 2018 Dec 8. https://asia.nikkei.com/Spotlight/Japan-Immigration/Japan-enacts-divisive-foreign-worker-bill-to-ease-labor-shortage

85. World Health Organization. Japan: Health System Review [Internet]. [Updated 2018; cited 2018 Nov 25]. Available from: http://apps.who.int/iris/bitstream/handle/10665/259941/9789290226260-eng.pdf;jsessionid=5E8D4C6125118E613132CA81B02306D7?sequence=1



Supplementary Table 1. Extracted Data	Study Characteristics						Factors for Well-being		
Study Abbreviation (*Japanese publication)	**Study Design**	**Study Area**	**Migrant Nationality**	**Number**	**Mental Health Variable**	**Epi Tool**	**Barrier**	**Facilitator**	**Policy recommendation related to international migrants**
Students									
Kakefuda, 2004 * [16]	Cross-sectional, Qualitative	Honshu	Brazilian	66	Adaptation Mental well-being	Questionnaire Interview	Low Japanese language skills, Low support from teachers or parents, Problems with studying	Good communication with Japanese or other Nikkei Brazilians, Having plans for after graduation or future	Creation of a mental health care system for foreign students.
Qu, 2013 [17]	Cross-sectional	Tokyo	Chinese	194	Mental well-being	ECRS GHQ VIA	Attachment Anxiety, Attachment Avoidance, Length of Stay beyond one year	Cultural Identity	Improve intercultural communication between Asian countries to facilitate clinical interventions and prevention programs.
Sun, 2013 [18]	Cross-sectional	Tokyo	Chinese	253	Psychological distress	Questionnaire GHQ-30 AAS TCI	Marginalization (loss of original culture but do identify with new one; a poor acculturation strategy), Harm Avoidance	Social support, Self-directedness	Foster a positive outlook between Japanese culture and Chinese culture; Mass media from both countries should aim to promote mutual understanding and acceptance.
Eskanadrieh, 2012 [19]	Cross-sectional	Sapporo	Chinese (40%) other Asians (32%) South Koreans (14%) non-Asians (14%)	480	Depressive symptoms	Questionnaire CES-D	Female, Masters degree student, Arts students, Self supporting, Living alone	None	Examination of the mental health condition of international students; Japan requires more conclusive evidence for the seriousness of mental health and should take appropriate action.
Murphy-Shigematsu, 2002 [20]	Qualitative	Nonspecific Japan	Unspecified Various	15	Psychological barriers	Counseling Sessions	Unrealistic post-migration expectations, Discrimination, Cross-cultural communication	Coping strategies, Support-seeking, Refocusing of goals	Multicultural training for university staff; Support systems for international students such as pre-departure and post-arrival orientations.
Guo, 2013 [21]	Cross-sectional	Sapporo	Chinese	142	Social capital Mental well-being	Questionnaire ISCS SWLS ASSIS	Dependence on SNS for entertainment, Acculturative stress	Use of SNS for information seeking, Social capital	Further studies on SNS use and acculturation.
Ozeki, 2006 [22]	Cross-sectional	Aomori City	Chinese-speaking (39) English-speaking (32)	71	Transcultural stress	Questionnaire GHQ-30	Finances, Being a Chinese-Speaker	Being an English-speaker	Provide support for Chinese speakers in terms information in native language and adapting to daily life in Japan.
Zheng, 2005 [23]	Cross-sectional	Tokyo	Chinese	161	Psychosocial impact	Questionnaire Open-ended questions	Studying medicine or social sciences; Migration from a SARS affected area of China	More than 1 year of residence; below age 31	Social discrimination against students during disease outbreaks should be minimized; A safe environment should be fostered for their recovery.
Kono, 2014 [24]	Cross-sectional	Sapporo	Chinese (166) South Korean (59) Other Asian (139) Non-Asian (64)	480	Depressive symptoms	Questionnaire CES-D	Lack of scholarship, Poor housing conditions	Sleep quality, Exercise	Authorities should make sure international students can support themselves and maintain their health.
Ma, 2007 * [25]	Cross-sectional	Kanto, Tohoku, Hokkaido	Chinese	267	Mental health status Psychosociological factors	Questionnaire GHQ SDS	Female, Feeling irritated daily, Uneasy characteristics, Low self-esteem	Emotional support network	Improve emotional support networks for international students; Further studies to compare student mental health status in Japan and China.
Matsuda, 2013 [26]	Cross-sectional	Kyushu	Chinese	199	Stress management	Questionnaire DHQ-28	Pre-contemplation and contemplation stage stress management	Maintenance stage stress management, Active practicing stress management behavior	None
Hori, 2012 [27]	Retrospective, Case series	Ibaraki	Asian (66%) Russian (10%) Europian (7%) Latin american and African (5%) mixed	59	Depression, Adjustment disorder, Insomnia, and Schiophrenia	Medical records (diagnosed using ICD-10)	Stresses related to studying, Inter-personal relationship problems, Cultural stress	None	Preparations for emergency consultations by non-Japanese at health centers.

Wang, 2009 * [28]	Cohort study Qualitative	Tokyo, Ibaraki	Chinese	7	Mental stress	GHQ-30 Semi-structured interview	Weak personal relationships, Loneliness, Poor daily life management, Psychosomatic diseases	Comfortable lifestyle, Good relationship with others, Clear aim of studying abroad	Provide guidance for daily life management; Provide information about studying and future; Support the creation of communication networks.
Mizuno, 2000 * [29]	Cross-sectional	Kanto area, Tokai area, Chugoku area	Chinese (159) Korean (59) Taiwanese (46)	264	Mental support Help-seeking behavior	Questionnaire	Concerns about helper responsiveness, Living with spouse	Female, Experience with professional supports	Construct a more effective support system
Workers									
Lee, 2015 * [30]	Cross-sectional Comparative	Tokyo	Korean (66) Chinese (50) other Asian (8) non-Asian (2)	INTL (126) JP (150)	Job stress and mental health	Questionnaire	Overwork, Interpersonal relationship stress	None	A prevention-centered strategy is needed to address job stress.
Asakura, 2008 [31]	Cross-sectional	Northern Kanto	Braziian	313	Psychological symptoms	Questionnaire GHQ-12	Discrimination, Environmental hazards at work, Higher education (low-skill job mismatch), Higher Japanese level (can understand discrimination)	None	To improve the health of migrants: Establish policies and practies designed to decrease ethnic discrimination in the workplace; Improve education about diversity.
Onishi, 2003 [32]	Qualitative	Tokyo	Bangladeshi (13) Pakistani (7) Iranian (4)	24	Coping Strategies for Mental Welll-being	Narrative analysis of Interviews	Percieved low social status, Societal disregard of their socio-economic background, Prejudice	Adapting to and accepting Japanese language and culture, Strong Muslim identity	Develop immigration policies that empower migrants as participants in society and potential Japanese citizens, not only to fill economic needs; Media should create more positive image of non-Japanese; Schools should develop cultural awareness and tolerance for diversity to foster a multi-cultural Japan.
Ohara-Hirano, 2000 [33]	Qualitative	Tokyo	Filipino	265	Stress	Categorization of Interview responses	Worry about sending money home, How family will use such money	Emotional support from family	It is important to consider how a migrant's cultural background informs their adjustment to living in Japan.
Date, 2009 [34]	Cross-sectional	Nagasaki City	Chinese	81	Depressive Symptoms	Questionnaire CES-D	Longer working hours, Age over 30 years	None	Health authorities should consider working time and age as important indicators for reducing depressive symptos among foreign workers.
Ohara-Hirano, 2005 * [35]	Comparative Cross-sectional	Kanto	Filipino	in JPN (265) in KR (401)	Socio-economic strain, Depression	Questionnaire CES-D	Strain about family, Strain about future	None	Consider the background not only the host country but also the labor-exporting country to understand migrant mental health.
Cho, 2005 * [36]	Case series	Japan	Chinese (11) Indonesian (2) Vietnamese (1) Filipino (1)	15	Suicide	Secondary data (JITCO)	Male, Age over 30 years, Shorter stay in Japan (<8 months), Lack of communication	None	With rapid deterioration of mental conditions, the economic burden of foriegn workers and possible feelings of failures should be taken into account; Appropriate psychiatric treatment is then required.
EPA Care Workers									
Ohara-Hirano, 2012 [37]	Cross-sectional	Indonesia	Indonesian	102	Mental Health Status	Questionnaire GHQ	Difficulty bringing family to Japan, Worry about national board examination	Strong motivations for working in Japan	More studies comparing Filipino and Indonesian EPA nurse mental health.
Nugraha, 2016 [38]	Cross-sectional	Japan	Indonesian	92	Mental Health Predictors	Questionnaire GHQ-12 MSPSS SCAS	Female, Feeling skills are underutilized, Fatigue	Social support, Job satisfaction, Socio-cultural adaption, Confident about passing the national board examination	Provide information to prospective care workers about working conditions in mother language to better prepare them physically and mentally for migration to Japan; Long-term follow-up studies are recommended.
Sato, 2016 [39]	Cross-sectional	Japan	Indonesian	71	Mental Health Status	Questionnaire GHQ-28	Female, Having passed the national board certification	Language support, Informational support	Sharing experiences gained by health facilities that have accepted EPA nursing staff previously; Establishment of an ongoing support system aimed at workers who have completed the national qualifications.

Yamamoto, 2018 * [40]	Cross-sectional	Japan	Indonesian (38) Filipino (26) Vietnamese (8)	72	Stress	Questionnaire SOC	Qualitative burden, Physical burden, Confusion about workstyle differences between Japan and the participant's country, Degree of skill utilization, Job suitability	Adjustment to life in Japan, Understanding Japanese language, Satisfaction of work and life, Higher sense of coherence	Consideration of job burden and workplace environment to improve sense of coherence.
Exclusively Women									
Paillard-Borg, 2018 [41]	Qualitative	Tokyo	Fillipino	3	Subjective Well-Being	Focus Group Interview	Japanese language, Isolation from family, Overwork	Religion, Connection with migrant community, Maternal Identity	Support for and education about the health of migrant women.
Shah, 2018 [42]	Cross-sectional	Kanto Area	Nepalese	189	Quality Of Life	Questionnaire WHOQOL-BREF	Differences in medical culture, Unwanted pregnancy, Abortion	Health education	Reproductive health education for migrants.
Mothers									
Martinez, 2017 * [43]	Qualitative	Northern Kanto	Brazilian	18	Mental health	Semi-structured interviews	Pregnancy and child rearing, Anxiety about work and income, Complications due to being a foreigner, Absence of social support	Equal and family connected family, Strength to continue working, Circumstances right conditions to settle down in, Religiousity	Understand the socio-cultural factors affecting the health; Provide intervention that lead pregnant and perperal Brazilian women to have appropriate health behaviors.
Kawasaki, 2014 * [44]	Systematic Review	Japan	Various	Study: INTL (15) JP (18)	Mental health status support	Systematic Review	Cross-cultural conflict, Dilemma, Lack of support, Isolation, Loneliness	None	Immigrant women need access to information and social support services, and help in coping with difficulties as immigrants.
Jin, 2016 [45]	Mixed-method	Kanto	Chinese	22	Depression Stress	Questionnaire EPDS SSS CCS	Unable to follow traditional birthing preparation, low socio-economic status	Social Support	Trascultural healthcare training in Japan, especially on Chinese birthing practices (Zuoyuezi and Yuezican) to reduce cross-cultural stress.
Kita, 2015 [46]	Systematic Review	Japan	Various	Study: INTL (1) JP (35)	Psychological Health	Systematic Review	Anxiety about birth in Japan, Lack of support, Social isolation, Language barrier, Lack of information, Racial discrimination, Limited access to health care, Low socio-economic status	Strengthening social-connectedness	Establishment of multilingual and culture-specific health services, strengthened social and support networks as well as support and political action.
Imai, 2017 [47]	Cross-sectional Comparative	Japan	Chinese (29) Korean (8) Vietnamese (5) Fiipino (5) Mixed	INTL (68) JP (97)	Depressive Symptoms	Questionnaire EPDS SSPS-P	Lack of support from partner or family, Low socio-economic status	None	Medical staff to encourage support from family and provide information about prepatory maternal services
Bunketsu, 2010 * [48]	Cross-sectional	Kanto	Chinese	132	Child-rearing stress	Questionnaire	Time limited due to childcare, Worry about their children after return to China, Difficulties in maintaining work and family balance, Loneliness	Talking with with Chinese friends, Making efforts to change their moods or perception, Patience	For prompt and effective harmonazation with Japanese society, Provide Childcare support with easy-to-use child care facilities, Chance of studing Japanese, Well-baby clinic conducted in Chinese
Shimizu, 2002 * [49]	Cross-sectional Comparative	Kanto, Chubu area	Brazilian (111) Chinese (70) Korean (29)	INTL (210) JP (625)	Parenting stress	Questionnaire	Difficulties with work and child rearing balance, Worry about child characteristics or language ability, Inadequacy of child care environment	Seek help for others	Establish a place to relieve stress speaking native language

Fujiwara, 2007 * [50]	Qualitative	Tokyo	Asian Europian Middle Eastern	9	Loneliness Isolation	Semi-structured interviews	Difficulties in verbal communication, Confusion with Japanese medical culture, Less support	Positive attitude by midwife towards interaction	Provide enough time for caring, Set-up translators or multi-language brochure
General Migrant Populations									
Shakya, 2018 [51]	Cross-sectional	Central Japan	Nepalese	642	Mental Health Status	Questionnaire MSPSS PSS CES-D SCL-90-R	Needing a interpreter during visit to Japanese healthcare facility	Paying health insurance regularly, satisfactory self-rated health, longer stay in Japan	Interventions focusing on reduction of language barrier between migrants and health workers.
Koyama, 2016 [52]	Case Series	Osaka	American (5) Chinese (5) Australian (2) Taiwanese (2) Various	20	Mental Halth Consulation	Medical Records	Cultural differences, Japanese language barriers to describe symptoms	None	Sensitization of health care professionals to transcultural care by facilitating medical professional interpreters and liaison-consulation models. Government should introduce comprehensive social support of non-Japanese people.
Moon, 2007 [53]	Cross-sectional Comparative	Osaka	Korean (204)	KR (204) JP (221)	Subjective well-being	Questionnaire CGA TMIG-IC GDS-15	Korean ethnicity, Absence of sense of purpose of life	None	More pro-active ethnicity-specific support from existing community organiztions and authorities.
Koyama, 2012 [54]	Case Series	Osaka	American (2) Australia (1) New Zealand (1) England (1)	5	Mental Health Consultation	Medical Records SDS STAI	Cultural differences, Japanese language barriers to describe symptoms, Unemployment	None	Promotion of transcultural medical interpreters for psychosomatic medicine and comprehensive social support system for non-Japanese by government.
Ichikawa, 2006 [55]	Cross-sectional	Tokyo Osaka	Afghan	55	Anxiety Depression Posttraumatic Stress	Questionnaire HSCL-25 HTQ	Detention by immigration authorities, Premigration trauma exposure, Living alone	None	Reconsideration of tightening of immigration policies in terms of both health and human rights.
Itoi, 2007 * [56]	Cross-sectional	Kanto	Cambodian	49	Acculturative stress	Questionnaire modified LASC-I	Female, Less education, Fewer Japanese language skills, Shorter length of staying in Japan, Lower occupational status	None	Improve the education systems, Japanese language education, an employment systems, develop a program to promote an education for the people in the host country
Fukaya, 2002 * [57]	Cross-sectional	Kanagawa prefecture	Filipino (43) Nikkei-Brazilian (38) Various	110	Acculturative stress Depressive symptoms	LASC-I CES-D ISEL-S	Less education, Shorter length of stay, Lower social support	Social support	Increase social support for foreign residents.
Ohara-Hirano, 2001 * [58]	Cross-sectional	Kyushu	Filipino (36%) Peruvian (9.4%) Chinese (9.4%) Indonesian (9.0%) Various	280	Depressive symptoms	Questionnaire CES-D	Non-western national origin, Migration to Japan for work or training	Western origin nationality, Migration to Japan for marriage, Living with family	Japanese society needs to set up support systems for finding jobs, improving daily life, and so on.
Lee, 2009 [59]	Cross-sectional Comparative	Japan	North Korean defector	in JP (30) in KR (51) JP (43)	Mental health and Quality of Life	BDI WHOQOL-Bref Semi-Structured Interview	Language fluency, Adopted nationality	Longer length of stay	Better monitoring of pervasive depression among refugees; Consideration of social support system and effective medical interventions for proper adjustment to Japan.
Brazillian 'Nikkeijin'									
Miyasaka, 2007 [60]	Cross-sectional Comparative	Northern Kanto Sao Paulo	Braziian	in BRZ (100) in JP (107)	Mental Health Disorders	Medical Records	Living alone, Staying in Japan for short periods	Living with family, Having a work of friends	Mental heath professionals should encourage building a network of friends and support systems.
Kondo, 2011 [61]	Cross-sectional Comparative	Northern Kanto Sao Paulo	Brazilan	in BRZ (331) in JP (172)	Mental Health Status	SDQ	Adverse circumstances at home and at school while living in Japan	None	Further verification studies.

Asakura, 2006 [62]	Cross-sectional	Northern Kanto	Brazilian	265	Psychological disturbance	Questionnaire GHQ-12	Living alone, Longer stay in Japan, Lower economic status, Migration to Japan due to unsatisfactory socio-economic conditions in Brazil, Severe family life concerns	Moderate Japanese Language Proficiency, Plans to return to Brazil as soon as possible	Provision of more information about Japan life, culture and working conditions prior to migration to form more accuate expectations and help with adjustment through consultation services; Government policy outlining treatment of foriegn workers to stop discrimination and promote equal treatment; Change societal mindset to one of embracing diversity; Opportunites for advancement and job training. NGO and government support services for foreign workers will promote health and assimilation.
Tsuji, 2001 [63]	Cross-sectional	Northern Kanto	Brazilian	40	Mental Health Disorders	Medical Records	More distant descendant of Japanese	Higher Japanese language ability, Living in Japan beyond 5 years	Further studies on mental health of Brazilians.
Miyasaka, 2002 [64]	Cross-sectional Comparative	Northern Kanto	Brazlian	in BRZ (213) in JP (158)	Mental Health Status	Questionnaire SRQ-20	Being female, Being a smoker, Previously being a student in Brazil	None	Authors established a mental health network for Brazilians in Japanese migrant population centers that is proving useful.
Takenoshita, 2015 [65]	Cross-sectional	Northern Kanto	Brazilian	1252	Psychological Well-Being	Secondary Data Questionnaire CES-D	Being Female, Unemployed, Percieved descrimination	Bonding social capital (relatives live nearby nearby)	None
Honda, 2005 * [66]	Cross-sectional	Kanto	Brazilian	150	Mental Illness, Risk Factors	Questionnaire SRQ-20	Living alone, Shorter periods of stay (< 5 years), Previous psychiatric problems, Lower Japanese ability, Culture conflict betweeen Japan and Brazil	None	None
Tsuji, 2000 * [67]	Cross-sectional Comparative	Tochigi Bauru (Brazil)	Brazilian	BRZ (213) JP (157)	Depression	Questionnaire SRQ-20	Female, Under 30 years old, Being a student prior to immigration	None	None
Tsuji, 2002 * [68]	Cross-sectional	Tochigi	Brazilian	151	Depression	Questionnaire SRQ-20	Current findings: Not significant; Findings 2 years previous with same indicators: Female, Youth, Student prior to immigration	Longer staying in Japan (>2 years)	None
Asakura, 2005 * [69]	Cross-sectional	Aichi	Brazilian	112	Psychosomatic distress	Questionnaire	Less time spent with parents, Difficulties in adaptatinng to Japanese customs and social environment, Higher frequency being not understood by parents, Poorer adaption to school	Good relationships with Japanese friends, Good family relationships, More social support, Longer staying in Japan	Health promotion for ethnic minority students.
Otsuka, 2001 * [70]	Cross-sectional	Tochigi	Brazilian	163	Aculturation, Mental Disorders	Questionnaire	Living alone, Poor aculturation, Isolation from society, Low Japanese language skills, Shorter length of stay	Bicultural identity	None

Supplementary Table 2. Study Quality Assessment

Citation	Pre-migration	Post-migration	Non-migrant comparison	Valid measurement	Justification of sample size	Study Quality
Students						
Kakefuda, 2004 * [16]		X		X	X	3
Qu, 2013 [17]		X		X	X	3
Sun, 2013 [18]		X		X	X	3
Eskanadrieh, 2012 [19]		X		X	X	3
Murphy-Shigematsu, 2002 [20]	X	X			X	3
Guo, 2013 [21]		X		X	X	3
Ozeki, 2006 [22]	X	X		X	X	4
Zheng, 2005 [23]		X		X	X	3
Kono, 2014 [24]		X		X	X	3
Ma, 2007 * [25]		X		X	X	3
Matsuda, 2013 [26]		X		X	X	3
Hori, 2012 [27]		X	X	X	X	4
Wang, 2009 * [28]		X		X		2
Mizuno, 2000 * [29]		X		X	X	3
Workers						
Lee, 2015 * [30]	X	X	X	X	X	5
Asakura, 2008 [31]		X		X	X	3
Onishi, 2003 [32]	X	X			X	3
Ohara-Hirano, 2000 [33]		X		X	X	3
Date, 2009 [34]		X		X	X	3
Ohara-Hirano, 2005 * [35]	X	X		X	X	4
Cho, 2005 * [36]		X		X	X	3
EPA Care Workers						
Ohara-Hirano, 2012 [37]	X			X	X	3
Nugraha, 2016 [38]	X	X		X	X	4
Sato, 2016 [39]		X		X	X	3
Yamamoto, 2018 * [40]		X		X	X	3
Exclusively Women						
Paillard-Borg, 2018 [41]	X	X		X		3
Shah, 2018 [42]		X		X	X	4
Mothers						
Martinez, 2017 * [43]		X		X	X	3
Kawasaki, 2014 * [44]		X				1
Jin, 2016 [45]		X		X	X	3
Kita, 2015 [46]		X		X	X	3
Imai, 2017 [47]	X	X	X	X	X	5
Bunketsu, 2010 * [48]		X		X	X	3
Shimizu, 2002 * [49]		X	X	X	X	4
Fujiwara, 2007 * [50]		X		X		2
General Migrant Population						
Shakya, 2018 [51]	X	X		X	X	4
Koyama, 2016 [52]		X		X	X	3
Moon, 2007 [53]		X	X	X	X	4
Koyama, 2012 [54]		X		X		2
Ichikawa, 2006 [55]	X	X		X	X	4
Itoi, 2007 * [56]	X	X		X	X	4
Fukaya, 2002 * [57]		X		X	X	3
Ohara-Hirano, 2001 * [58]	X	X			X	3
Lee, 2009 [59]		X	X	X	X	4
Brazillian 'Nikkeijin'						
Miyasaka, 2007 [60]		X	X	X	X	4
Kondo, 2011 [61]	X	X	X	X	X	4
Asakura, 2006 [62]		X		X	X	3
Tsuji, 2001 [63]	X	X			X	3
Miyasaka, 2002 [64]	X	X	X	X	X	5
Takenoshita, 2015 [65]		X		X	X	3
Honda, 2005 * [66]	X	X		X	X	4
Tsuji, 2000 * [67]		X		X	X	3

Tsuji, 2002 * [68]		X		X	X	3
Asakura, 2005 * [69]	X	X		X	X	4
Otsuka, 2001 * [70]		X		X	X	3

Supplementary Table 3. Epidemological Tool Abbreviations

AAS	Acculturation Attitude Scale
ASSIS	Acculturative Stress Scale for International Students
BDI	Beck Depression Inventory
CCS	Cross-Cultural Stress Scale
CES-D	Center for Epidemiologic Studies Depression
CGA	Comprehensive Geriatric Assessment
ECRS	Experiences in Close Relationship Scale
EPDS	Edinburgh Postnatal Depression Scale
GDS-15	Geriatric Depression Scale
GHQ-30	General Health Questionnaire 30
HSCL-26	Hopkins Symptoms Checklist 25
HTQ	Harvard Trauma Questionnaire
ISCS	Internet Social Capital Scale
ISEL-S	Interpersonal Support Evaluation List Scale
LASC-I	Latin American Stress and Acculturative Stress and Coping Inventory
Medical Records	Retrospectively analyzed patient mental health records
MSPSS	Multidimensional Scale of Perceived Social Support
PSS	Perceived Stress Scale
SCAS	Sociocultural Adaptation Scale
SCL-90-R	Symptoms Checklist-90-Revised
SDQ	Strength and Difficulties Questionnaire
SDS	Self-rating Depression Scale
SOC	Sense Of Coherence
SRQ-20	Self-reporting Questionnaire
SSPS-P	Social Support Perception Scale for Parents Rearing Preschoolers
SSS	Social Support Scale
STAI	State-Trait Anxiety Inventory
SWLS	Satisfaction with Life Scale
TCI	Temperament and Character Inventory
TMIG-IC	Tokyo Metropolitan Institute of Gerontology Index of Competence
VIA	Vancouver Index of Acculturation
WHOQOL-BREF	World Health Organization Quality of Life- Brief Version

PRISMA 2009 Checklist – bmjopen-2019-029988 – Mental Well-Being of International Migrants to Japan: a Systematic Review

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5-6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	6
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6-7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	7-8
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	9
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	9
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	9
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	10
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N/A

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Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	9
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	10
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	10
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	10-11
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	14
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	11-12
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	14
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	12-13
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	19-20
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	20
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	21

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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