

RESEARCH ON MIGRANT WORKERS IN THE LAST 24 YEARS: PROGRESS, FRAMEWORK, AND TRENDS

YAN, Y.¹ – LI, J. Y.^{2*} – LIU, C. G.¹ – JIANG, X. Y.¹ – GENG, Y. Q.¹ – GAO, J.¹

¹*School of Business, Shanghai Dianji University, 300 Shuihua Road, Pudong, Shanghai, China
(phone: +86-136-2186-5665; fax: +86-021-3822-3122)*

²*Nursing Department, Guizhou Nursing Vocational College, Dazhi Road, Huaxi District,
Guiyang, Guizhou, China*

**Corresponding author*

e-mail: lijianyikf@foxmail.com; phone: +86-188-0431-2394; fax: +86-085-4541-2023

(Received 27th Feb 2025; accepted 13th May 2025)

Abstract. Current research on “migrant workers” lacks a comprehensive synthesis and requires an integrated analytical approach. Therefore, this paper aims to integrate academic literature from the past two decades indexed in the three Core Collections of the Web of Science and to use CiteSpace as a visual analytics tool for analyzing the basic knowledge, interaction, status, and future research related to “migrant workers”. We establish a systematic knowledge framework based on statistical, collaboration, co-citation, and co-occurrence analyses, provide an international perspective on the topic, and suggest future research directions. Furthermore, CiteSpace’s results suggest that: (1) institutional and regional collaborations are frequent, particularly in developing countries; (2) the term is closely associated with research in the social sciences and medical fields; and (3) research topics focus on various occupation-specific groups of migrant workers. The findings suggest that future research should consider migrant workers’ job performance, public health concerns, organizational roles, relevant policies, and the application of new technologies. This paper innovatively employs CiteSpace for a multidimensional analysis of the frequency and trends of “migrant workers” in academic research. It establishes a framework to convey key information and outlines future directions for bibliometrics and sociology in an intuitive, visual, concise, and time-efficient manner.

Keywords: *immigration, visualization, CiteSpace, bibliometrics, framework*

Introduction

“Migrant workers” have received much attention worldwide in recent years. “Migrant workers” refers to people who move to another region or country for employment, including domestic and international migrants in our study. The characteristics of migrant workers are: (1) away from their hometowns (Pega et al., 2021); (2) involvement in non-intellectual labor; (3) low social status. First, migrant workers help alleviate labor imbalances between countries and regions. Due to poor working conditions in developing nations, many international migrants seek employment in developed countries, satisfying the labor demand in the developed countries. For instance, Australia has established migration agencies and employment policies for migrant workers, providing post-arrival support and attracting numerous workers from developing nations to address its labor shortage (Wright et al., 2022). Moreover, migration can boost income and improve living conditions. In China, individuals often move from low-income areas to high-income ones for better wages (Yang et al., 2020; Wu and Wu, 2021). The International Labor Organization (ILO) reported that there were approximately 169 million international migrant workers globally, making up 4.9 percent of the global workforce by 2021. Additionally, China’s National Bureau of Statistics (NBS) indicated that, there were about

295.62 million migrant workers in China—20.5 percent of the total population by the end of 2022. These statistics highlight a growing number of migrant workers engaged in regional mobility who not only impact labor markets but also enhance residents' living standards. Thus, migrant workers represent an important group deserving attention and research.

In theoretical research, scholars have extensively studied migrant workers. Specifically, they have examined the inequality between migrant workers and local employees in the job market. For instance, migrant workers are engaged in more hazardous work compared with the locals in some countries, which triggers higher mortality (Cha and Cho, 2014; Nappo, 2022; Ronda-Perez et al., 2019). They are much more challenging to enjoy the same medical and healthcare services as local employees (Pega et al., 2021; Pham et al., 2019). They have lower fewer job positions, less hiring rates, and fewer career promotion possibilities (Pérez et al., 2012). Secondly, the physical and psychological health of migrant workers is another concern. Most migrant workers come from underdeveloped countries or regions. The disadvantaged social status determines that they cannot receive equal resources and may suffer health problems. In terms of mental health, many migrant workers (especially rural migrant workers in cities) suffer from more significant cultural adaptation pressure, which leads to depression and mental health damage (Li et al., 2019; Zhong et al., 2016). In terms of physical health, migrant workers take high-risk work and have insufficient health awareness, which results in many occupational diseases and poorer physical health (Hesketh et al., 2008; Sadarangani et al., 2017; Saparamadu et al., 2017). Thirdly, migrant workers encounter rights violation issues. Their rights are often neglected and violated due to the lack of protection from local laws or organizations (Boucher, 2019). Gender inequality among migrant aggravates human rights violations (Meyer et al., 2019). The above problems have aroused deep concern globally and have become a critical social hotspot that many scholars aspire to solve.

In practice, many countries and regions protect the rights of migrant workers through legislation and national coordination. In terms of legislation, Malaysia has established legislation frameworks to protect migrant workers from exploitation and human rights violations (AB Hamid et al., 2018). In terms of organizations, governmental and non-governmental organizations (such as labor unions and community organizations) have been established to fight for the rights of migrant workers (Jiang and Korczynski, 2023). Regarding international coordination, in 2017, the Association of Southeast Asian Nations (ASEAN) leaders jointly signed the ASEAN Consensus on the Protection and Promotion of the Rights of Migrant Workers, which clearly stipulates the rights of migrant workers and their family members (Bal and Gerard, 2018). These protective measures show that, protecting migrant workers with integration is an essential part of social governance, and this topic has received much attention.

Despite the efforts of scholars and policymakers in research and management, current findings on migrant workers reveal a significant shortcoming: fragmentation. Some studies address health issues and the history of migrant workers (Mucci et al., 2020; Buat, 2020), while other explore the terminology (such as labor migration, foreign workers, and immigrants). This inconsistency complicates readers' understanding of the definition, research status, and cross-disciplinary collaborations. This study uses bibliometric to review the research landscape and interdisciplinary cooperation in migrant worker studies through precise definition of concepts. This study focuses on the following research questions:

1. Whether the topic of migrant workers is popular and important?
2. Who are active in this field?
3. Who are authoritative in this field?
4. Which topics will be the mainstreams in the future?

This study is meaningful to bibliometrics, sociology and public policy making. This study employs CiteSpace to analyze bibliometric data on “migrant workers” over the past 20 years, which broadens the scope of bibliometric research and enhances understanding of this specific group’s current research status. Additionally, it reviews sociological studies related to “migrant workers,” including performance-wage and social capital, which are significant for advancing sociology and interdisciplinary connections. From the policy perspective, this study helps governments and legislative institutions to find out the highly focused problems among migrant workers more clearly and quickly so that they can propose targeted policies, regulations, and laws to help migrant workers live and work better. At the same time, we predict the future research directions of migrant workers, which can also inspire stakeholders to come up with solutions in advance.

The structure of this paper is as follows: The “Method” section mainly describes the research methodology of this paper (inclusion and exclusion criteria, information sources, search, selection process, risk of bias assessment, analysis tool, analysis process). The “Results” section presents analysis results, containing statistical analysis (journals and categories with the most annual publications), collaboration analysis (authors, institutions, and regions that collaborate to publish academic papers in “migrant workers”), co-citation analysis (journals, literature, and authors with the most co-citations), and co-occurrence analysis (co-occurrence categories, co-occurrence keywords, and keyword bursts). The “Discussion” section shows the knowledge framework based on the results, discussions, and limitations with solution suggestions.

Method

To ensure the standardization and rigor of this study, we strictly follow the PRISMA guidelines (Page et al., 2021), which include six parts: exclusion criteria, information sources, search, selection process, analysis tool, and analysis process.

Inclusion and exclusion criteria

Establishing inclusion and exclusion criteria is the first step in finding the target literature resources. There are several main inclusion criteria in this study. First, the literature sources should be from the authoritative and representative core collection databases. Second, the articles or reviews to include should be related to “migrant workers”. Third, since we focus on articles published in the term of “migrant workers” over the last twenty years or so, the sources should be published between 2000 and 2023; fourth, data modes or details (such as language) should be complete, comparable, and operable by bibliometric analysis tools or software.

There are some exclusion criteria. First, articles or reviews that are announced, retracted, or withdrawn should be excluded. Second, the sources should be relevant to “migrant workers” semantically. As a semantics study, we define “migrant workers” as a social group working in different places. Sources that only discuss “migrant,” “migration,” “immigration,” “worker,” “refugee,” “foreigner,” “asylum,” or “labor” will

be excluded. The above terms, if solely used, cannot sufficiently represent the core meaning and connotation of “migrant workers.”

Information sources

All the data sources in this paper are derived from the three core collections of the Web of Science, which are the Science Citation Index Expanded (SCIE), the Social Sciences Citation Index (SSCI), and the Arts & Humanities Citation Index (AHCI). The Web of Science, as the world’s largest and most resourceful database, contains excellent literature in various disciplines, which provides high-quality data sources for bibliometric analysis, thus laying a solid foundation for the accuracy and authority of the results.

This study will temporarily exclude Scopus, Engineering Village (EI), PubMed, and Emerging Sources Citation Index (ESCI) and only include SCIE, SSCI, and AHCI for the following reasons. (1) SCIE, SSCI, and AHCI are commonly recognized as “qualified” in migrant workers’ research because they include many high-quality papers, which aligns with our goal of exploring who are authoritative participants in this term. (2) We must face the dilemma that current bibliometric analysis tools and software can usually analyze papers from a single database, making bibliometric analysis from multiple databases difficult. For instance, the software CiteSpace, which we will use in this study, has difficulty analyzing papers from SCIE, EI, and Scopus simultaneously. (3) Most previous bibliometric studies utilized the core collections of Web of Science, ensuring consistency with this research (Geng and Maimaituerxun, 2022a; Geng et al., 2022b). (4) Data duplication exists between other database and the Web of Science, potentially leading to double counting and affecting data analysis credibility. Thus, we selected the core collections of Web of Science as the data base in this study. Of course, we admit that restricting searches to SCIE, SSCI, and AHCI means some types of collaboration analysis may be lost. Future studies could explore bibliometric analysis using other databases on the same topic and compare results with those from the Web of Science database.

Search

The time span is from January 1st 2000 to August 1st 2023. The topic keyword is migrant workers. We exclude other synonyms, such as “labor migration,” “economic migration,” “circular/seasonal migration,” “foreign worker,” “immigrant” “employment of migrants/foreigners/refugees/asylum seekers” and “economic migrants”. We limit the documents to “Article” and “Review” and the language to “English”.

Selection process

We used the back-to-back strategy and followed the PRISMA guidelines with 4 steps (Fig. A1 in the Appendix) (Xiao et al., 2024a, b). Two authors collected data independently from the same database on their respective computers and then compared the search results. If there was a disagreement, a third author would judge independently. The manual exclusion criterion was “this paper is not relevant to migrant workers research”. (1) First, according to the above search process, two authors obtained 1812 papers, respectively. Then, they conducted a preliminary check and found no duplicate or incomplete papers. (2) The two authors checked for papers by reading titles and abstracts. After they have independently preliminarily confirmed the

irrelevant papers, a third author judges and confirms the result; in this step, we found 5 papers unrelated to the topic and excluded them. We then obtained 1807 papers. (3) Two authors further screened the papers by reading their contents. Again, the results of both screenings are sent to a third author for confirmation. During this step, no papers were irrelevant or removed. (4) To ensure the accuracy of the screening results, we imported 1807 papers into CiteSpace for review. The final results showed that no papers were excluded. After screening out irrelevant documents after the above 4 steps, we retained 1807 documents as the final data sources.

Risk of bias assessment

It is important to explain how the risk of bias is evaluated and dealt with to reduce errors in research results. The process of the risk of bias assessment is as follows: (1) we set up two groups (two people in each group). One group was the experimental group, and the other group was the control group. The experimental group had two authors, and the control group had the other two participants. (2) The two groups were explained in detail, including the definition and connotation of “migrant workers”. They were then asked to repeat the data collection process according to the inclusion and exclusion criteria identified above. (3) The results showed that both groups had the same results and were consistent with our original results, which included 1807 articles as the final data. This suggests a low risk of bias in this study.

Analysis tool

The analytical tool used in this study is CiteSpace version 6.2 R3 and 6.2 R7. This bibliometric software features result visualization and data screening objectification (Geng et al., 2024a, 2023a). Result visualization allows readers to quickly understand key aspects of the research field on migrant workers, while data screening objectification ensures the credibility of the findings.

Analysis process

We perform statistical, collaboration, co-citation, and co-occurrence analysis, along with theoretical summaries based on data collected from the core collections of Web of Science (*Fig. A2*).

(1) Statistical analysis. This section includes the number of annual publications, journals, and classifications of the literature in the term in the past 24 years to understand the term’s fundamentals.

(2) Collaboration analysis. This section is based on the SCIE, SSCI, and AHCI literature on “migrant workers”, which includes the analysis of the principal co-authors and collaborating organizations and regions to understand the current state of paper-publication collaboration in this term and identify the most active ones.

(3) Co-citation analysis. This section includes major co-cited journals, articles, and authors to help readers understand the significant stakeholders in the term and fully grasp its research status.

(4) Co-occurrence analysis. This section analyzes the co-occurring categories, keywords, and bursting words to understand the most salient research directions and hotspots and provide predictions for future developments.

(5) Theoretical summaries. This section establishes a knowledge framework, further compares studies in other languages in local journals, and shows future research

directions to summarize the research results concisely and clearly, help scholars quickly understand the knowledge of the term, and deepen future research.

We want to highlight that the findings of the above process (1) are framed in terms of the statistical results of the Web of Science, and the findings of processes (2), (3), (4) are framed in terms of the results suggested by CiteSpace.

Results

Statistical analysis: Whether the topic of migrant workers is popular and important?

The statistical analysis aims to provide a knowledge base of this term and answer the question: Whether “migrant workers” research is popular and important? Answering this question gives researchers essential insights into migrant workers, including trends in publications, journals, and disciplines. This information enables scholars to quickly grasp the preferences and scope of relevant journals on the topic.

Number of publications per year: roughly increasing

To visualize the number of publications on migrant workers over the last 20 years, we developed the formula $Y = a + b_1X + b_2X^2$ (Fig. 1). The dependent variable is the number of publications, while the independent variable is the year. The fitted equation is $Y = 0.422X^2 - 1.0057X + 7.4184$, with an R^2 value of 0.9783, indicating that this equation is significant and valid for prediction.

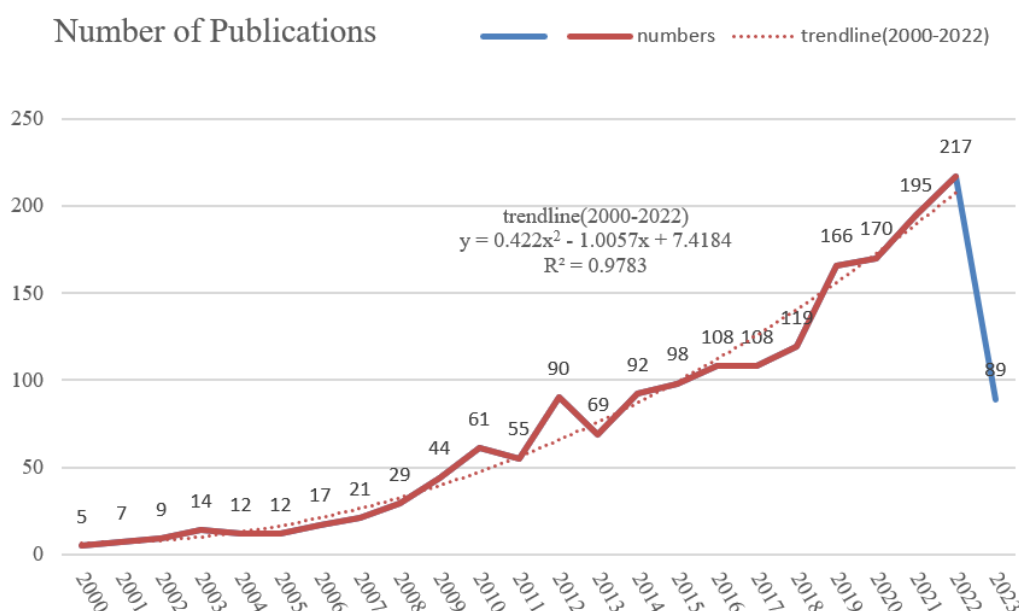


Figure 1. Publications per year (2000-2023)

As shown in *Figure.1*, the annual publications show a roughly increasing trend over the last 20 years. Specifically, it can be divided into the following phases. The first phase was from 2000 to 2008, in which the publications grew slowly, showing that the study of migrant workers was slowly coming into the limelight in the earlier years with little attention. This may be because the number of migrant workers is relatively small,

and the social issues they cause have not received sufficient attention from scholars. The publication rose with fluctuations in the second phase (from 2009 to 2013). That may be because as migrant worker issues gradually became significant social concerns, scholars began to explore this group. The third phase, from 2013 to the present, has shown a steady increase. This may be due to Sustainable Development Goal 8, Decent Work and Economic Growth, established by the United Nations in 2015, which emphasizes eliminating labor market inequalities and protecting workers' rights. As a result, migrant worker groups are gaining increased attention. It is worth noting that the number in 2023 is only available as of August 1st, thus showing a decline.

If we observe the two trend lines, we can find that the growth rate of the publications in the selected database is accelerating, which indicates that the research on migrant workers is becoming continuously hotter. The trend may be due to the increased mobility of the population under globalization, the urban labor shortage brought about by urbanization, and the increased care for migrant workers in recent years. Such a trend is different from existing studies (Geng et al., 2023a, 2024b). Previous studies in different fields have shown fluctuating increases in annual publications, whereas the term is accelerating, which also suggests an increase in interest in the term.

Publications in journals: focus exclusively on migrant workers

As shown in *Table A1* (see *Appendix*), which lists the top ten journals in the number of publications on “migrant workers” in the selected database, there are several findings.

(1) The journals with high publication volumes in the database either focus exclusively on migrant workers (some focus more specifically on niche topics such as migrant worker health) or multidisciplinary. Specifically, journals focus on migrant workers, such as “The Journal of International Migration,” “Journal of Ethnic and Migration Studies,” “Asian and Pacific Migration Journal,” “Journal of Immigrant and Minority Health,” and “Ethnic and Racial Studies”, have published 39, 37, 25, 23, and 16 articles, respectively, with a total share of 7.748%. Multidisciplinary journals, such as the “International Journal of Environmental Research and Public Health,” “PLOS One,” “BMC Public Health,” “Sustainability,” “Work Employment and Society”, published 86, 39, 35, 23, and 22 articles, respectively, with a total share of 11.344%. We find that the percentage differences between the two types are not significant.

(2) The influence of journals is average. These journals' impact factor quartile range is mostly Q2 and Q3, indicating that papers on “migrant workers” are mainly published in journals with medium influence. As a result, we encourage top-tier journal editors to pay more attention to “migrant worker” topics and publish more papers in this term.

The above results provide two insights for scholars: first, when scholars submit their articles, they can focus on specialized and multidisciplinary journals. Second, scholars should further improve the quality of their articles and publish their papers in journals with higher impact.

Category of journals: mainly related to social and public environmental research

The top ten categories of publishing papers about “migrant workers” in the selected database are related to social and public environmental research (*Table A2*).

After classifying the first ten categories, we specifically divided them into the sociology cluster (including public environmental occupational health, sociology, and

interdisciplinary social sciences), geography (including geography and area studies), environment (including environmental sciences and environmental studies), and business (demography, economics, and labor industrial relations). The total share of the sociology cluster is 35.78%, indicating that the migrant worker's social issues receive much attention.

In detail, many pieces of literature are in the category of “public environmental occupational health” (415 articles, 22.966%), followed by “sociology” (147 articles, 8.135%) and “demography” (145 articles, 8.024%). This proves that research on “migrant workers” tends to focus on their health and social issues, which reflect the fact that migrant workers encounter severe physical and mental problems in the professional and living environment.

Based on the analysis, we recommend that scholars examine migrant workers in public environment, occupational health, sociology, and demography, while also exploring interdisciplinary studies.

Collaboration analysis: Who are active in this field?

Collaborative analysis includes the analysis of the publications from the co-authors, institutions, and regions perspectives. The results help answer the following question: Who are the active? Answering this question gives researchers insight into collaboration among migrant workers. Collaboration encompasses the partnerships between authors, institutions, and regions in published academic papers. This helps scholars select appropriate collaborators internationally.

Authors collaboration: Hall, BJ is much more active

The authors' collaboration illustrates the authors' cooperative relevance to the topic and presents active authors. CiteSpace results suggest that Hall, BJ is the most active collaborator. CiteSpace proposes several details.

(1) Collaboration among authors is extensive but inactive. Analysis of Citespace data reveals that 271 out of 682 co-authors have collaborated on two or more publications, accounting for nearly 40%. However, only the top 14 co-authors had five or more collaborations (*Table A3*), indicating a lack of active collaboration. This may stem from the multidisciplinary research collaboration, which often involves complex designs and requires intensive collaboration to standardize processes and validate results.

(2) Scholars have been active in collaborations in the last decade, but their influence remains limited. Eleven of the top 14 co-authors began collaborating within this period, indicating a shift from individual work to teamwork. However, these authors have a centrality of 0, indicating limited impact (see *Table A3*). Specifically, the most active author is Hall BJ (working at New York University), who worked extensively with scholars from other institutions such as Johns Hopkins Bloomberg School of Public Health, Western Sydney University, etc. He recently focused on the mental and physical health of migrant workers in Southeast Asia (Garabiles et al., 2020), demonstrating that the emphasis on humanistic care for migrant workers is gaining traction.

As it is shown in *Figure 2*, the author's collaboration network clusters with 682 nodes and 807 links. CiteSpace suggests that internal cooperation within clusters is frequent, but the author's cooperation between different clusters is relatively less apparent. CiteSpace further proposes the following detailed conclusions.

(1) Some scholars study the mental health issues of migrant workers, such as “#1 cross-sectional study”, “#2 health-related lifestyle behavior” and “#4 comparative analysis”. Specifically, in “#1 cross-sectional study”, Cai Y collaborates in exploring the link among distress, depression, and suicidal psychological stress among migrant workers in China via cross-sectional studies (Long et al., 2022; Wang et al., 2021). In “#2 health-related lifestyle behavior”, Zhou J focuses on the adverse lifestyles that are detrimental to the psychological and physical health of migrant workers in rural and urban China (Yang et al., 2017). In “#4 comparative analysis”, Reid A uses comparative analysis to focus on the control, bullying and mental health between migrant workers and natives in Australia (Reid et al., 2020; Daly et al., 2019). The studies indicate that the psychological issues of migrant workers are gaining attention. Their involvement in labor-intensive industries, characterized by monotonous and repetitive tasks, hinders their sense of accomplishment, and may lead to mental health problems due to long hours work. Future research should continue to prioritize the mental well-being of migrant workers.

(2) Other clusters are about health issues of migrant workers. For instance, in “#0 diphtheria antitoxin”, Chen MIC focuses on health management for diphtheria, measles, and COVID-19 among migrant workers in Singapore (Ang et al., 2022a, b; Wong et al., 2022). In “#3 genital infection”, Forleo MA explores the problem of Chlamydia trachomatis genital infection among migrant sex workers in Italy (Matteelli et al., 2003). The studies indicate that migrant workers constitute a larger share of the labor market in countries with high population mobility, and addressing their physical health is crucial for achieving decent work (Yan et al., 2023a, b).

Based on statistical and cluster analyses, we recommend that scholars employ multiple research methods and foster interdisciplinary collaboration. Specifically, a mix of longitudinal, cross-sectional, and comparative studies should be utilized to analyze varying results. In terms of interdisciplinarity, it is advised that psychology, medicine, and sociology converge to examine the physical and mental health of migrant workers and investigate how well-being affects social development and stability.



Figure 2. Author collaboration network

Institution collaboration: University of London and institutions in developed countries are much more active

The institution cooperation statistical analysis will help to identify the more active institutions and facilitate future targeted cooperation for scholars. University of London is the most active institution. University of London's refers only to central/university-level collaborations (not member institutions). CiteSpace further suggests the following findings.

(1) Institutions in developed countries cooperate more actively in this term. The top ten institutions with the most active cooperation are in three developed countries (UK, Singapore, USA) and one developing country (China). In addition, institutions in developed countries have higher overall rankings than those in developing countries: two of the top three institutions are in developed countries, namely the University of London and the N8 Research Partnership. Their counts are 72 and 50, respectively, and their centrality is 0.19 and 0.08 (*Table A4*), suggesting that the intensity and impact of their collaborations are much better.

(2) Institutions in developing countries start collaboration later than those in developed countries. Specifically, most institutions in developed countries start collaboration before 2005, while those in developing countries start after 2006. That may be due to economic differences. Developing countries were relatively backward in the economy before 2005, providing fewer decent, law-protected jobs for migrant workers and accordingly paying less attention to them. However, globalization and urbanization in the past decades made developing countries grow in the economy, productivity, and legislation, leading to more migrant workers enjoying interactions with local communities, social welfare, public attention, and supportive actions (Baig and Chang, 2020; Siu, 2015).

(3) Institutions in China have significant influence and authority in cooperation. Specifically, institutions in China account for half of the top ten cooperative institutions; besides, among the top four institutions with centrality over 0.1, which indicates that the institution is influential and authoritative, half are in China (Chinese University of Hong Kong and Sun Yat-Sen University). That proves that Chinese institutions are both active and influential. One of the reasons for this phenomenon is that in recent years, the Chinese government's implementation of rural revitalization has greatly promoted rural development in various regions of the country (Geng et al., 2023b), and domestic urban and rural labor flows are frequent. Thus, local institutions pay more attention to migrant workers.

Figure 3 shows the institution collaboration network with 460 nodes and 817 links. In general, the connection complexity of the nodes suggests active collaborations between institutions. Specific findings suggested by CiteSpace are as follows.

(1) Institutions in the medical discipline focus on migrant workers as a cluster, including the London School of Hygiene & Tropical Medicine and the Johns Hopkins Bloomberg School of Public Health. Specifically, the London School of Hygiene & Tropical Medicine ranks 19th among collaboration institutions and studies the physical health of migrant sex workers in underdeveloped countries (Puri and Cleland, 2006; Busza and Baker, 2004). In contrast, Johns Hopkins emphasizes mental health issues faced by migrant workers in underdeveloped nations (Alahmad et al., 2020; Hall et al., 2019; Garabiles et al., 2019). Notably, while the London School is a member institution of the University of London, we define University of London as central/university-level collaborations. Therefore, London School is presented independently from the University of London in this clustering.

(2) Most Chinese institutions prefer to analyze how migrant workers integrate into cities, such as University of Hong Kong, Chinese University of Hong Kong, Fudan University, Zhejiang University, Peking University, University of Macau, Hong Kong Polytechnic University, Sun Yat-sen University (Fig. 3). In recent decades, an increasing number of migrant workers have been pouring into cities in China. They have complex impacts on society, and geographical differences make such impacts more complicated, so there are abundant problems to be solved (Zhong et al., 2016). Specifically, Chinese institutions have collaborated in exploring how migrant workers live in cities decently from the perspective of the living environment, medical care, social benefits, and children's health (Wong et al., 2007; Xue and Li, 2022; Ma et al., 2018; Cao and Liu, 2015).

Based on statistical and cluster analysis of institutional collaboration, it is evident that the health and welfare of migrant workers is a key concern. For instance, University College London addresses sexually transmitted diseases and mental health issues among migrant workers (Hesketh et al., 2006; Li et al., 2007), while the Chinese University of Hong Kong focuses on their social welfare and life satisfaction (Mou et al., 2009; Yue et al., 2019). We suggest that scholars focus on the health and well-being of migrant workers in underdeveloped countries, which is a popular topic among collaborative institutions. Regarding institution selection for collaborative research, we suggest targeting China due to its large population of migrant workers and the positive attitude of collaborative institutions towards prior research. This will facilitate high-quality studies in this field. Additionally, Chinese institutions should examine other regions to compare cases and enhance result diversity.

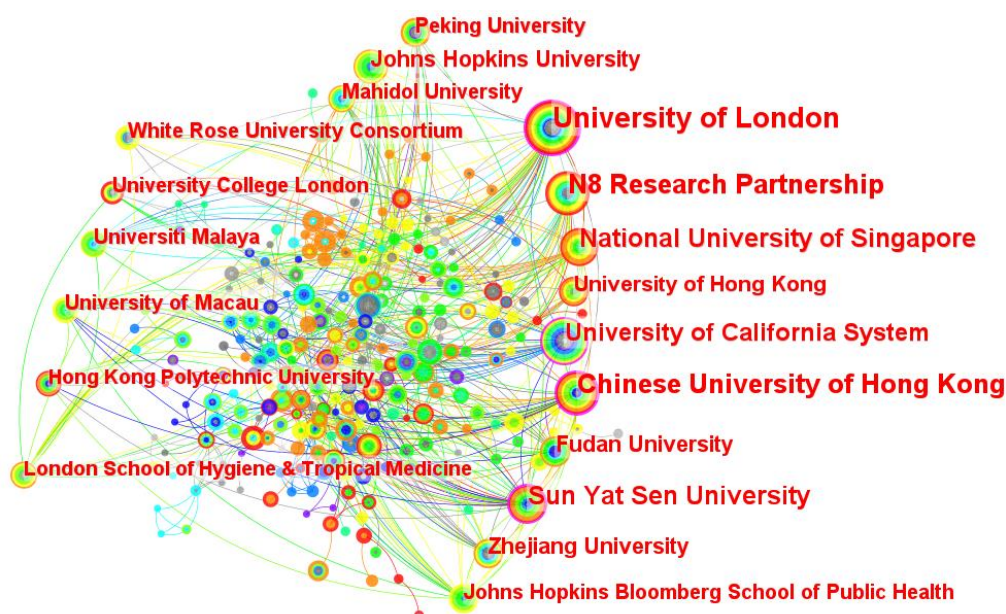


Figure 3. Institution collaboration network

Regional collaboration: China is much more active

Regional cooperation examines geographical differences in cooperation from a more macroscopic view and helps identify future cooperative research targets. Statistical analysis indicates that:

(1) Developed regions are significantly more active than developing ones, consistent with the results of institutional cooperation. Developing countries account for only 1/5 of the total (China and Thailand), and four of the top five are developed countries (*Table A5*), suggesting that developed regions are more dominant in this area. We note, however, that both developed and developing regions prefer to analyze migrant worker issues in developing regions (Busza and Baker, 2004; Wang and Fan, 2012; Frenkel et al., 2012). That is because these regions lack comprehensive medical and social security systems, juristic guarantee systems, and adequate humanistic care for this group, resulting in more prominent physical and mental health problems among migrant workers (Simkhada et al., 2018; Cheng et al., 2015).

(2) Developed regions are more authoritative in collaboration. The top three regions with the highest centrality are the USA, England, and Australia (*Table A5*), and all are developed regions. That suggests that collaboration in developed countries is more influential. In contrast, China is the only developing country with a centrality above 0.1. That implies that quantity and quality are both critical in future regional cooperation.

(3) The most active cooperative country is not the most authoritative. Specifically, China ranks first with 552 collaborations and centrality 0.17 (*Table A5*), indicating that China is enthusiastic. However, it is still needed to improve the quality of published articles. The representative research explores migrant workers' barriers to enjoying medical insurance and corresponding consumption behaviors (Chen et al., 2020; Tang et al., 2020).

Figure 4 illustrates regional collaboration clusters with 86 nodes and 385 lines. The results exhibit four apparent research topics.

(1) Scotland of the UK and Spain are the major cooperative regions in the cluster “#0 ethical codes”, which discusses the ethical codes of employment agencies for migrant workers and the dignity, ethics, and moral standards of migrant medical workers (Forde and Mackenzie, 2010; Shaffer et al., 2022).

(2) Countries cooperating in “#1 A. duodenale (ancylostoma duodenale)” include China, Thailand and Canada. This cluster analyzes the physiological health issues of A. duodenale infection among migrant workers (Sahimin et al., 2017).

(3) The cooperating countries of cluster “#2 migrant care work” are the USA, Israel, and Italy. The topics include investigating the states of migrant care workers in remote rural areas, social recognition and moral dilemma of migrant care workers, and migrant care workers' attitudes towards care work for the elders (Spiliopoulos et al., 2021; Cordini and Ranci, 2017; Arieli and Yassour-Borochowitz, 2023; Ayalon and Rapoliene, 2022).

(4) The cooperative countries in “#3 low-wage migrant workers” mainly include Australia, Germany, and New Zealand, and the topics cover the challenges, future, countermeasures, and policies for low-income migrant workers, especially elderly workers in specific periods, such as the COVID-19 epidemic (Saparamadu et al., 2021; Dutta, 2021; Amrith, 2022). Recently, scholars have discussed the relationship between gender differences and migrant workers' wages, finding that the wages of male migrant workers were generally higher than those of females (Fu et al., 2023). In essence, this is a gender equality issue worth pondering.

According to the clustering of regional collaboration, collaboration between developed and developing countries primarily addresses the health and social issues faced by migrant workers. We recommend that institutions and scholars in developing countries enhance exchanges with developed nations through data sharing. In turn,

developed countries should offer opportunities for visits and establish research institutes in developing nations to foster interaction and collaboration.

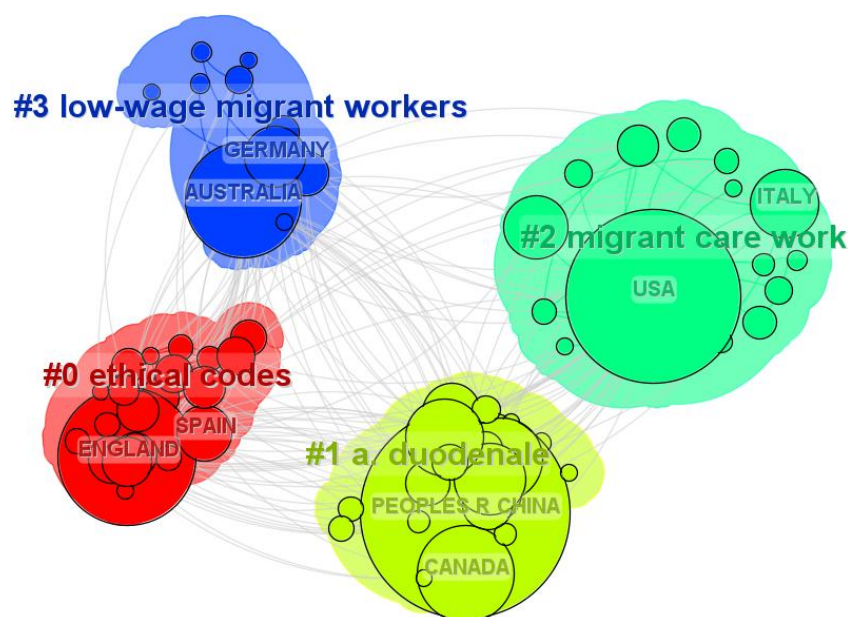


Figure 4. Region collaboration network

Co-citation analysis: Who are authoritative?

After analyzing the authors, institutions, and regions active among migrant worker research, we aimed to identify the leading journals, references, and influential authors in this field. This chapter conducts a co-citation analysis of reference to explore key participants and frontiers (Ferreira et al., 2016). The analysis addresses the third research question: who are the authorities?

Journal co-citation: authoritative co-cited journals are about social sciences

Journal co-citation analysis is conducive to exploring the primary sources of the field, showing the authoritative journals, and suggesting other relevant research fields. Statistical analysis of journal co-citations by CiteSpace shows that, most authoritative co-cited journals are related to social sciences (4 out of 10) and health sciences (5 out of 10). Most co-cited journals are highly recognized, as 6 out of 10 are in Q1. Specifically, the following points from CiteSpace are worth further discussion.

(1) The co-citation counts and authority do not match exactly. Specifically, the Journal of Ethnic and Migration Studies ranked first with 337 co-citations, but its centrality was only 0.02. In contrast, the American Journal of Public Health ranked 10th with 178 co-citations, but its centrality reached 0.22. That may be because the latter is a medical journal, which usually has a more significant co-cited impact factor and influence.

(2) The earliest co-cited journals have the highest authority. For example, the journals with the highest centrality are “The American Journal of Public Health” (0.22) and “The International Migration Review” (0.11). They are the first co-cited ones (in the year of 2000). There are two possible reasons: first, earlier publications are more

likely to be the foundation of the term and naturally are more authoritative. Second, enjoying the benefit of highly cited papers, journals may pay more attention to the topics of the highly cited papers in the future publication process, making the journal easier to be co-cited.

(3) Medical journals with high impact factors appear among the top co-cited journals. Specifically, “Lancet” ranks fourth with 265 co-citations; its impact factor is high in the medical field (Q1, 1 out of 167 journals), although its centrality in “migrant workers” is not high. That shows that research on migrant workers is related to medicine, and their health problems are a hot focus. The latest research in “Lancet” discusses emerging infections among migrant workers; this study found that yellow fever can spread rapidly among migrant workers in Asia, particularly among construction workers, and that governments need to take effective countermeasures to manage the infectious disease (Tam et al., 2016).

In conclusion, on one hand, medical journals have a significant influence on the research of migrant workers, indicating that scholars pay close attention to their health issues. On the other hand, scholars should focus on early publications to enhance the influence of their papers.

We conduct co-citation clustering analysis to identify the research interests of journals on migrant workers, assisting scholars in finding suitable journals for their research. *Figure 5* shows the clusters of co-cited journals with 791 nodes and 3165 links. CiteSpace results suggests several detailed findings.

(1) Some clusters focus on individual studies of migrant workers, such as “#0 migrant sex worker”, “#1 migrant domestic worker”, and “#2 rural migrant worker”. Specifically, the most co-cited journals in the “#0 Migrant Sex Workers” cluster were Social Science & Medicine and Lancet, focusing on infectious disease prevention for migrant sex workers (Jirattikorn et al., 2022; Febres-Cordero et al., 2018; O’connor et al., 2022). In the “#1 Migrant Domestic Workers” cluster, key journals included Journal of Ethnic and Migration Studies and International Migration, addressing issues like workplace harassment (Lai and Fong, 2020), migratory motivation (Parrenas, 2021), and migration’s impact on domestic workers’ lives (Ho et al., 2023). Co-cited journals in the “#2 Migrant Workers” cluster featured China Economic Review and China Quarterly, examining factors affecting migrant workers’ settlement, entrepreneurship, and housing. This includes the digital economy’s effect on their income (Xia et al., 2024) and AI’s influence on their skills (Guang, 2021).

(2) Some clusters focus on the relevant organizations of migrant workers such as “#3 trade union” and “#6 UN migrant workers convention”. Highly cited journals in the “#3 Trade Unions” cluster include Sociology and the British Journal of Industrial Relations, which examine how trade unions assist migrant workers in accessing their labor rights (Tapia and Alberti, 2019; Thomas, 2020). The “#6 UN Migrant Workers Convention” cluster features journals like International Migration Review and Anthropological Quarterly, focusing on the effects of social organizations and legal policies on migrant workers’ employment and skills assessment (De Leo et al., 2023; Boucher and Wright, 2023).

(3) The clusters “#4 Mental health” and “#5 Comparative analysis” are duplicated in the section “Authors collaboration: Hall, BJ is much more active” on authors’ collaboration. This highlights the significance of migrant workers’ mental health and comparative research. These clusters are the key areas of this research, and scholars can pay more attention to them.

Based on our statistical analysis and clustering of journal co-citations, we found that: first, social science journals play a significant role in migrant workers research, particularly when interdisciplinary with medical journals. We recommend integrating social sciences with electronic information to investigate the effects of artificial intelligence and big data on the physical and mental health of migrant workers. Second, high co-citation journals concentrate on the health and employment of migrant workers. We propose aligning migrant worker research with Sustainable Development Goal 8 (Decent Work and Economic Growth). The International Labor Organization (ILO) emphasizes that decent work promotes freedom, justice, security, and dignity for workers by enhancing employment opportunities, strengthening social security, protecting basic rights, and fostering dialogue among governments, businesses, and trade unions. This is closely linked to the workplace health, occupational safety, and job stability of migrant workers.

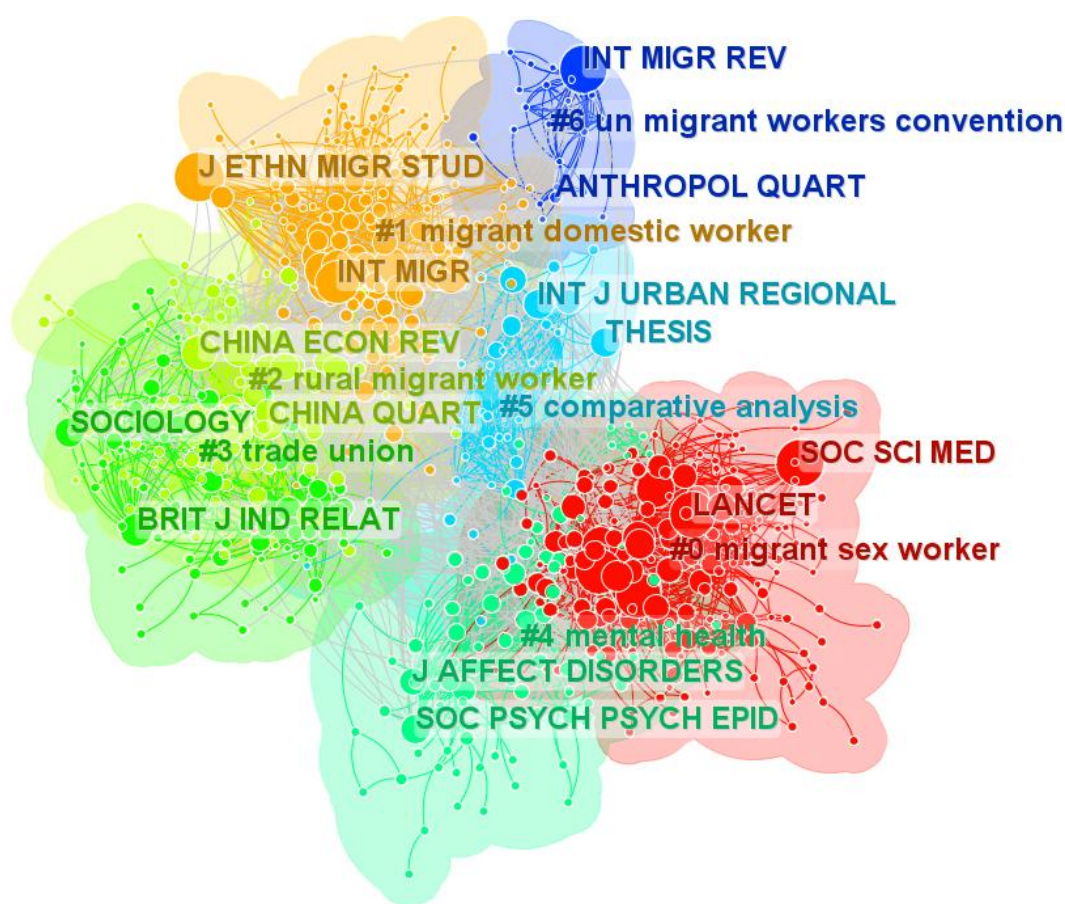


Figure 5. Journal co-citation network

Reference co-citation: Moyce SC's reference in 2018 is influential

Reference co-citation examines articles jointly cited frequently. These articles are foundational and essential in this term. CiteSpace further suggests the following findings.

Occupational safety for migrant workers is a hot topic. Highly co-cited references include “Moyce, 2018, Annu Rev Publ Health, V39, P351” (31 citations), “Hargreaves,

2019, Lancet Glob Health V7, PE872” (24 citations), and “Sterud, 2018, BMC Public Health, V18, P0” (14 citations). These studies indicate that migrant workers are more likely to engage in hazardous jobs but lack adequate protective policies (Moyce and Schenker, 2018; Hargreaves et al., 2019; Sterud et al., 2018). The most influential reference is “Alberti, 2014, Work Employ Soc, V28, P865,” which examines the mobility patterns of migrant workers in London’s hospitality sector and explores the reasons behind occupational instability (Alberti, 2014). Its impact stems from its early publication in 2014 and its interdisciplinary approach covering hospitality management, industrial relations, and demographics. For specific co-citation statistics see *Table A7*.

To identify the research themes of the co-cited references, we performed a co-citation cluster analysis of the references using CiteSpace, as shown in *Figure 6*. The co-cited reference cluster contains 989 nodes and 2782 links.

(1) The impact of COVID-19 on migrant workers has become the hot research direction in recent years. The cluster “#0 COVID-19 pandemic” contains the most nodes (131), and most of the nodes were first co-cited in the past four years, indicating that how migrant workers are affected by COVID-19 has attracted increasing attention recently. Co-cited references are “Hargreaves (2019)” and “Zhong (2018)”. Recent studies explore transnational migrant workers’ health status and received health services or social protection (Oliva-Arocas et al., 2022; Istiko et al., 2022; Kunpeuk et al., 2022).

(2) The migration intention and human rights violations of migrant workers have also been essential topics in recent years. Cluster “#2 moving intention” mainly discusses why migrant workers migrate. Co-cited references are “Alberti (2014)”, “Belanger (2020)”, “Yea (2017)” and “Strauss (2017)”. They find that living satisfaction is related to moving intention, which in turn affects their living options (Gan et al., 2016; Zou and Deng, 2020). Cluster “#5 rights abuses” investigates the violations of rights by migrant workers in workplaces and discusses measures to help short-term migrant workers obtain employment rights (Boucher, 2019; Underhill et al., 2019). Co-cited references are “Alberti (2018)”, “Clibborn (2021)”, “Clibborn (2018)”. Most of the co-cited literature of these two clusters was first cited in the past eight years, and they are essential hot topics besides the “COVID-19 epidemic”. We believe that after the decline of COVID-19, research on these two topics will be re-hot again.

(3) Early studies focus on their employment issues, migrant care workers, and residence choice. Scholars explore these topics from the perspectives of macroscopic analysis, text analysis, and cultural comparisons. Specifically, cluster “#1 employers use” examines the actions and influences of employers in hiring migrant workers (especially low-skilled migrant workers), including employment attitudes, employment strategies, and human resource management of migrant workers (Mackenzie and Forde, 2009; Forde and Mackenzie, 2009). Co-cited references are “Williams (2012)”, “Anderson (2010)”, “Binford Leigh (2013)” “Preibisch (2010)”. Cluster “#3 migrant care worker” examines this group’s work performances, believing that migrant care workers have positive relations with caregivers, colleagues, and bosses, though the relations may be affected by ethnic and cultural differences (Timonen and Doyle, 2010). “#4 housing choice” discusses factors affecting their accommodation choices, such as “Hukou (registered permanent residence)” in China (Tao et al., 2015). Representative nodes in these clusters are relatively old (about ten years ago), demonstrating that these topics are relatively traditional. Co-cited references are “Hu (2008)”, “Li (2007)”, “Wong (2008)” and “Hesketh (2008)”.

Statistical analysis and clustering of reference co-citations reveal two main findings. First, occupational safety has been a longstanding scholarly concern, encompassing workplace safety, employment stability, and work rights. The COVID-19 significantly affected migrant workers. Future research should explore its impact on their work forms, skills, and physical and mental health in the post-pandemic era. Second, quality of life is a traditional research theme primarily addressed by Chinese scholars. With reforms to the household registration and improved living conditions, migrant workers' quality of life has notably enhanced. Future studies could integrate psychology, sociology, and economics to examine the mental health, gender equality, and intergenerational parenting among the new generation of migrant workers.

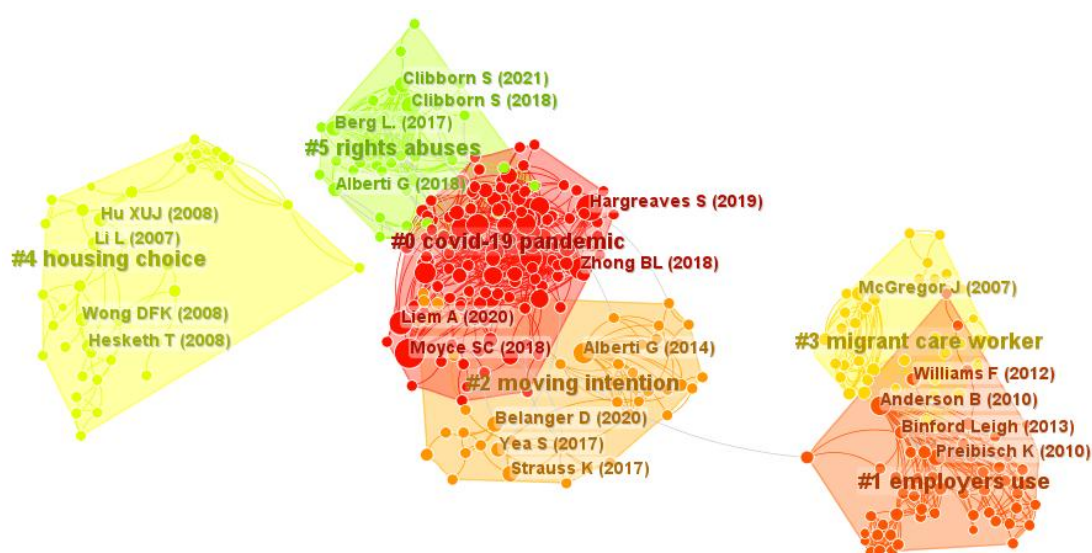


Figure 6. Reference co-citation network

Author co-citation: Anderson B plays a vital role

Author co-citation examines the authors co-cited in the term to find the most influential knowledge founders and provide references for future scholars. Statistical analysis of author co-citation suggests the following findings.

The World Health Organization (WHO) and the National Bureau of Statistics of China (NBSC) are frequently co-cited, highlighting their significant role in migrant worker research. Notably, these organizations were co-cited later, in 2015 and 2012, respectively, indicating a growing focus on migrant worker issues. Consequently, related publications and statistics are also gaining more attention. Anderson B is the most co-cited author with 134 citations and a centrality of 0.17, showing his authority and influence in the field. The main research topics include compliance and illegality of immigrant workers and the impact of immigration policies (Ruhs and Anderson, 2010; Anderson, 2014). See *Table A8* for detailed statistics.

The authors' co-citation timeline shows the influential authors in different topics in different periods in the selected database, as is shown in *Figure 7* generated by CiteSpace (1057 nodes and 5690 links).

(1) The three clusters with the most prolonged duration are “#2 migrant care worker”, “#3 trade union”, and “#0 mental health”. Among them, the most

representative co-cited author of cluster “#2 migrant care worker” is Yeoh BSA. This author mainly studies the specific work content of migrant care workers in Southeast Asian countries, the impact of migrant care work on their own families, and the relationship between migrant care workers and their caregivers (Huang et al., 2012; Lam and Yeoh, 2018; Liew et al., 2020). Southeast Asian countries such as the Philippines are famous labor-exporting countries, so, typically, many studies pay attention to migrant care workers in Southeast Asian countries. In cluster “#3 trade union”, the most representative author is Anderson B, who mainly studies how migrant domestic workers mobilize social organizations to fight for their rights and change their immigration status (Anderson, 2010). The primary co-cited authors of cluster “#0 mental health” include Wong DFK and Chen J, who focus on the mental health of migrant female migrant workers, the mental health literacy of Chinese migrant workers in different regions, and the physical and mental health of immigrants within China (He and Wong, 2013; Chen, 2011). In addition, we also notice that there are still many co-cited authors in these three clusters, which indicates that these research directions are still the focus of investigation in this term.

(2) The three clusters with the latest start time are “#6 migrant agricultural worker”, “#1 social support”, and “#4 migrant sex worker”. Among them, the representative co-cited author of cluster “#6 migrant agricultural worker” is Preibisch K. This author’s research mainly focuses on management policies for seasonal migrant agricultural workers in Canada and their occupational health and safety status without citizenship (Hennebry and Preibisch, 2012; Preibisch and Otero, 2014). The latest relevant paper discusses the role of new digital technologies in the picture of migrant workers. It has been found that digital cities promote entrepreneurship and increase people’s incomes, which significantly increases the willingness of migrant agricultural workers to settle in cities (Ren et al., 2023). The primary co-cited author of cluster “#1 social support” is Arcury TA, who mainly studies the correlation between immigrants’ mental health, sleep quality, and social support policies (Kiang et al., 2010; Sandberg et al., 2016). The representative co-cited author of cluster “#4 migrant sex workers” is Goldenberg SM, who mainly analyzes how to make migrant workers healthy and avoid AIDS from the perspectives of human rights, policies, and social support (Goldenberg et al., 2016).

(3) Cluster “#5 rural migrant worker” appears and finishes early. It shows that the research on rural migrant workers receives the earliest but noncontinuous attention. The reason may be that scholars emphasize specific types of migrant workers: they are segmented by specific occupations rather than by regions, which has led to more research on occupation-oriented topics such as migrant agricultural, sex, and care workers. We can also find that the time when cluster “#5 rural migrant worker” disappears coincides with when cluster “#6 migrant agricultural worker” begins, which can also confirm our speculation.

The authors co-citation analysis reveals that, first, the World Health Organization (WHO) and the National Bureau of Statistics of China (NBSC) are highly cited authoritative organizations. Recently, the International Labor Organization (ILO) and the International Organization for Migration (IOM) have also gained attention. Scholars should prioritize statistics and research reports on migrant workers from these organizations. Second, Anderson B and Wong DFK are the most prominent co-cited scholars focusing on occupational safety and mental health of migrant workers. Interested readers can refer to their published papers.

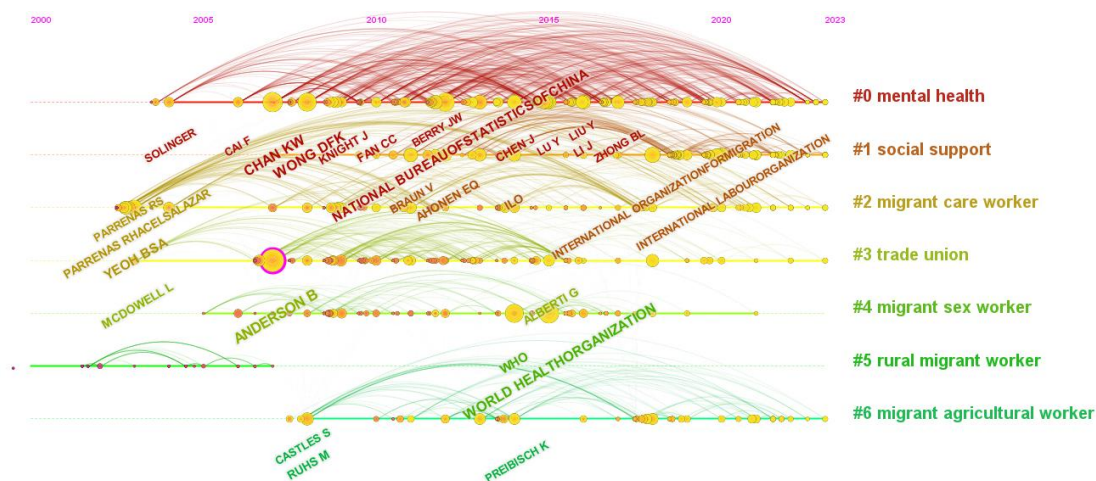


Figure 7. Author co-citation timeline

Co-occurrence analysis: Which topics will be the mainstreams in the future?

Via co-occurrence analysis, we can understand the progress and identify the most prominent hot spots in the research field. It is a very referential and instructive analysis. The results answer the following question: Which research topics on “migrant workers” will be the mainstream, as suggested by CiteSpace?

Category co-occurrence: similar to the top 10 publication categories

Category co-occurrence is different from simply summarizing the categories of the articles. It reveals the connections between the research term and these categories. A statistical analysis of category co-occurrence indicates that:

The top 10 categories that appeared are similar to the journal categories in the section “Category of journals: mainly related to social and public environmental research” and are not repeated, therefore. Public, Environmental and Occupational Health (0.58), Social Sciences, Interdisciplinary (0.22), Sociology (0.19), Economics (0.14), and Geography (0.11) all have centrality higher than 0.1, indicating high authority and interest. Notably, “Public, Environmental and Occupational Health” stands out with the highest co-occurrence rate and centrality, highlighting researchers’ concerns about the working conditions and safety of migrant workers. Recent studies include the mental health of agricultural migrant workers in Europe, health-related quality of life assessment, and the survey of occupational health of migrant workers (Urrego-Parra et al., 2022; Cho et al., 2023; Aktas et al., 2022). Statistical analysis results for category co-occurrence are shown in Table A9.

Figure 8 visualizes category co-occurrence, which includes 128 nodes and 396 links. In general, result suggests that nodes and clusters are intertwined, proving that the disciplines in this term are relatively comprehensive. CiteSpace generated five apparent clusters, which are detailed below.

(1) Cluster “#0 migrant domestic workers” is repeatedly mentioned. Its main co-occurrence categories are “sociology” and “demography,” which concern migrant domestic workers’ rights, management, costs of leaving home, and capital accumulation. Recent representative papers discuss the country’s management patterns of migrant domestic workers, flow paths of migrant domestic workers, and public

lifestyles of migrant domestic workers in large cities (Parreñas, 2021; Chan and Latham, 2022).

(2) The cluster “#1 migrants” is close to the theme keyword but refers to international migrant workers rather than domestic migrant workers. Notable disciplines include “public, environmental & occupational health” and “biomedical social science,” with research interests in occupational safety and health of transnational migrant workers and infection of low-skilled foreign labor under the COVID-19 epidemic (Moyce and Schenker, 2018; Hargreaves et al., 2019; Koh, 2020). Transnational migrant workers are highly focused on because they face more complex problems than domestic ones, which has more research value for scholars in different fields. Besides, research on transnational migrant workers is both transnational and multidisciplinary, leading to more academic cooperation and publications.

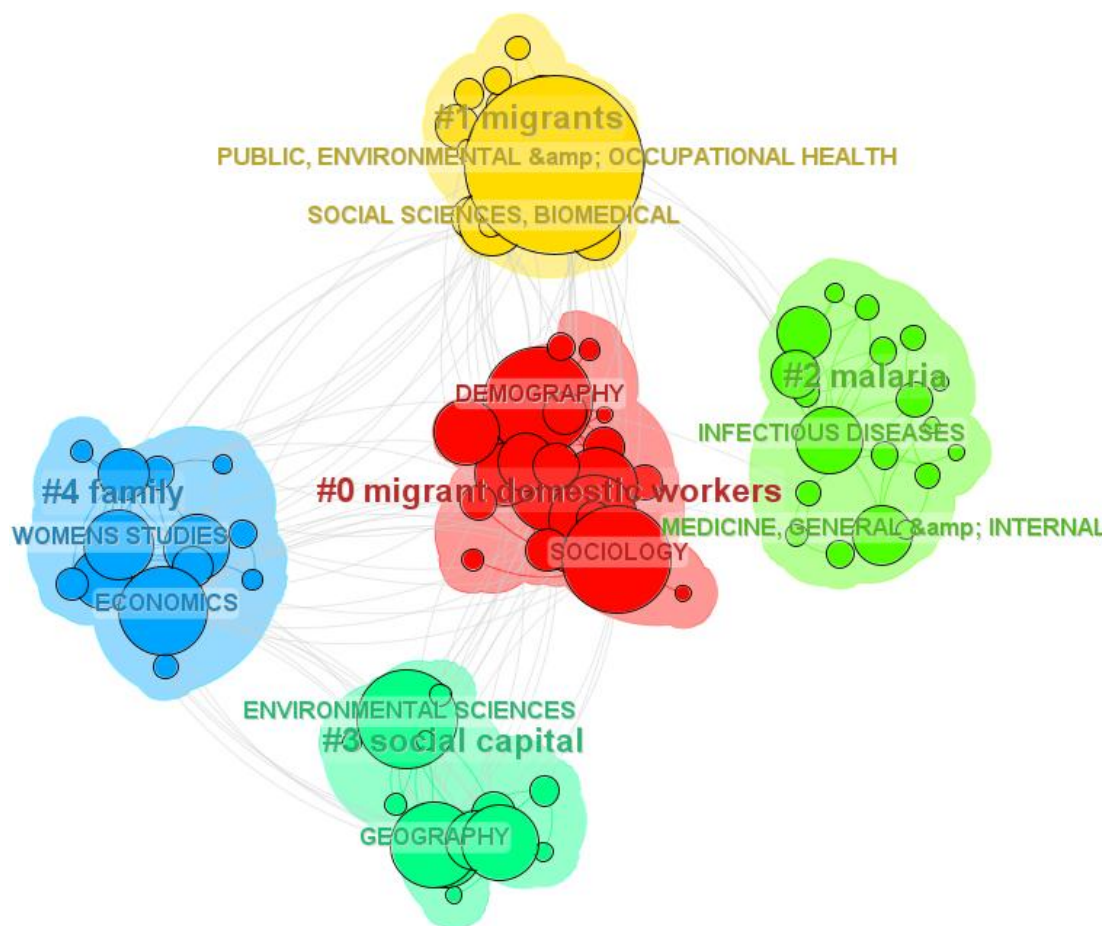


Figure 8. Category co-occurrence network

(3) Cluster “#2 malaria” is mainly associated with medical disciplines. The main co-occurring categories are “infectious diseases” and “general internal medicine,” and topics mainly include the factor analysis for the high prevalence of infectious diseases (such as malaria) among migrant workers, the role of protective equipment (such as mosquito curtains) in reducing malaria among migrant workers, and the intervention measures for migrant workers who suffer from malaria but receive delayed medical treatment (Nyunt et al., 2014; Lu et al., 2022; Sadarangani et al., 2017).

(4) Cluster “#3 social capital” is relatively minor in category co-occurrence. Categories include “geography” and “environmental sciences”, and related research mainly focuses on the impact of social capital on the life satisfaction of migrant workers in cities and the connection between the social context of transnational migrant workers and social capital resources (Liu and Pan, 2020; Andrzejewska and Rye, 2012).

(5) Clustering “#4 family” is also a hot topic. The representative node is “women’s studies,” suggesting that this topic is closely related to women, possibly because the relationship between female migrant workers and their families is a research direction that scholars are interested in. For instance, the social status of female migrant workers in India further deteriorated due to the blockade policy during the COVID-19 pandemic (Arora and Majumder, 2021).

Statistical and cluster analyses of category co-occurrence showed that public, environmental and occupational health was the most prominent discipline. We suggest researchers focusing on workplace safety, mental health, and work-family relationships among female migrant workers from sociology and public, environmental, and occupational health disciplines, particularly in relation to clusters “#4 Family” and “#2 Malaria”.

Keywords co-occurrence: “health,” “women,” “gender,” and “politics” are potential

Keyword co-occurrence summarizes the most frequently appearing keywords in the literature, from which we can explore the most relevant topics and understand the potential hot spots.

Among the top ten co-occurring keywords generated by CiteSpace, “migrant workers” appeared most frequently (469 times) and is the core topic of this study. It is worth noting that the co-occurring keywords “health”, “women” and “politics” need to be further explored. “Health” ranked third with 264 occurrences, highlighting the emphasis on migrant workers’ health, consistent with previous findings. Additionally, research on female migrant workers has gained scholarly attention from a gender perspective, particularly regarding their workplaces’ relationship to the AIDS epidemic and responses to exploitation (Yang et al., 2005; Rydzik and Anitha, 2020). The challenges faced by female migrant workers due to their dual vulnerability as “women” and “migrants” present significant opportunities for academic inquiry. Importantly, since 2010, the keyword “politics” has emerged as a new hotspot with growing relevance. Studies indicate that political organizations (e.g., trade unions) positively impact migrant workers by promoting political correctness through various initiatives (Alberti and Però, 2018; Mustchin, 2012; Marino, 2015). We believe that such organizations will increasingly advocate for migrant workers in the future, representing a promising area for deeper exploration. Statistical analysis results for keywords co-occurrence are shown in *Table A10*.

Figure 9 shows the timeline of keyword co-occurrence with 617 nodes and 1240 links.

(1) The cluster with the earliest and longest co-occurrence is “#2 seasonal migrant worker”. It starts the earliest (in 2000) and lasts now. Besides, this cluster’s earliest and the latest co-occurring keywords are not the same. Early co-occurrence keywords include “care” and “prevalence,” mainly focusing on the prevalence of domestic violence among seasonal short-term migrant workers (Van Hightower et al., 2000). The latest keywords include “migration infrastructure” and “autonomy,” mainly analyzing

the reasons for mobility instability of short-term cross-border migrant workers from the perspectives of infrastructure and migration autonomy (Spanger and Andersen, 2023).

(2) Timeline “# 0 commercial sex worker” has abundant topics continuously. It lasts over 20 years (2002-2022) with sufficient co-occurrence keywords, which indicates that the topic of commercial sex workers is a perennial hot topic. Early co-occurring keywords include “AIDS,” “prevention,” “condom use,” and “behavior,” mainly involving the relationship between HIV infection and drug use among commercial sex workers and HIV transmission and prevention among them (Bruckova et al., 2006; Surratt, 2007). Recently, the representative co-occurring keywords included “factory worker” and “rural migrant,” mainly involving the differences in personal health (such as HIV test) among various migrant workers (such as transnational, urban, and rural migrant workers) (Musumari and Chamchan, 2016).

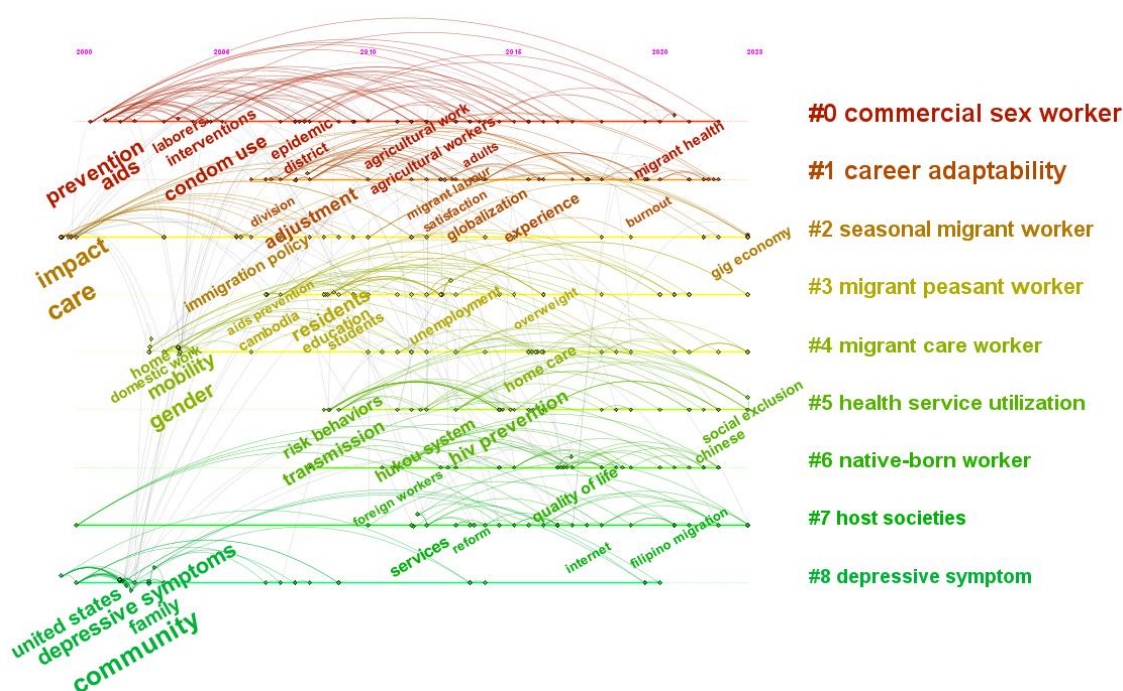


Figure 9. Keywords co-occurrence timeline

(3) Timeline “#5 health service utilization” and “#6 native-born worker” appear late. Among them, “#5 health service utilization” appears the latest (in 2009). Its recent research covers the correlation between medical service inequality and income of rural migrant workers and treatment differences in medical services of rural migrant workers (Li et al., 2021a, b). Cluster “#6 native-born worker” first appeared in about 2008, and its keywords include “inequality,” “association,” and “working condition.” Recent studies compare work-related injury risks and working and living conditions between migrant and local workers (Simmons et al., 2022; Ronda-Perez et al., 2019). Although these two clusters start late, they recently involve many new representative co-occurrence keywords, hinting those scholars can pay more attention to these two topics in the future.

(4) The cluster “#8 depressive symptom” ends the earliest but is essential. The representative co-occurring keywords include “family,” “suicidal ideation,” and

“community,” which are mainly related to the mental health problems of migrant workers. For example, some scholars investigate the depression of migrant workers in rural areas and give recommendations for prevention and treatment (Hovey and Magaña, 2002). Recent studies focus on job-related factors affecting the mental health of migrant workers, the prevalence rate of depression among rural migrant workers, and its influencing factors (Mo et al., 2022; Yang et al., 2022). The mental health of migrant workers has always been a hot topic discussed by scholars. Although there has been a lack of co-occurrence keywords in recent years, research in this cluster has been carried out continuously. It is believed that new topics will emerge with continuous research.

The statistical analysis of keyword co-occurrence and timeline reveals that female migrant workers are a current research hotspot, covering topics like workplace safety, infectious disease protection, and work rights. Scholars should continue to focus on this group and conduct comparative analyses between domestic and international female migrant workers, as well as differences across countries, regions, and occupations.

Secondly, the definition of migrant workers varies, leading to diverse research outcomes. For instance, “seasonal migrant workers” refers to short-term migration while “commercial workers” denote long-term migrants. Future studies should investigate the motivations behind the transition from short-term to long-term migration to address unstable labor mobility.

Lastly, mental health among migrant workers remains a significant topic. Despite fewer co-occurring keywords in recent years, related research continues. As exploration deepens, new topics will emerge.

Keywords burst: family, performances, diseases and health may be future mainstream

Keyword burst shows keywords with a sudden increase in citations in specific periods. This reflects the research hotspots at different times and dynamically demonstrates their evolution. *Figure 10* shows the top 15 keywords with the highest citation bursts from 2000 to 2023, suggested by CiteSpace.

(1) The three keywords with the earliest bursts and the most prolonged duration are “AIDS,” “community,” and “infection” (all started in 2002 and lasted for over nine years). That indicates that the early research focused on infectious diseases (such as AIDS) and community management and service.

(2) The top five keywords with the most vigorous bursts are “trade union” (6.65), “AIDS” (5.55), “family” (5.41), “HIV” (4.99), and “United States” (4.62). These keywords are the hot focus from scholars in the short term, which provides references for tracing the hot spots’ progress.

(3) The keywords with the latest bursts are “family,” “performance,” and “public health” (starting in 2020). Among them, “family” has a relatively short duration (only one year), but the strength is excellent (5.41). Besides, “performance” and “public health” have been the hot keywords since 2020 and are likely to become future hot research topics.

In summary, the CiteSpace results indicate that most of the burst keywords are related to medical and social sciences. This indicates that “migrant workers” research is highly correlated in these two disciplines, which is also consistent with the conclusions obtained in the journal co-citation analysis. Scholars can use the above analysis to determine future topics and enhance research novelties.

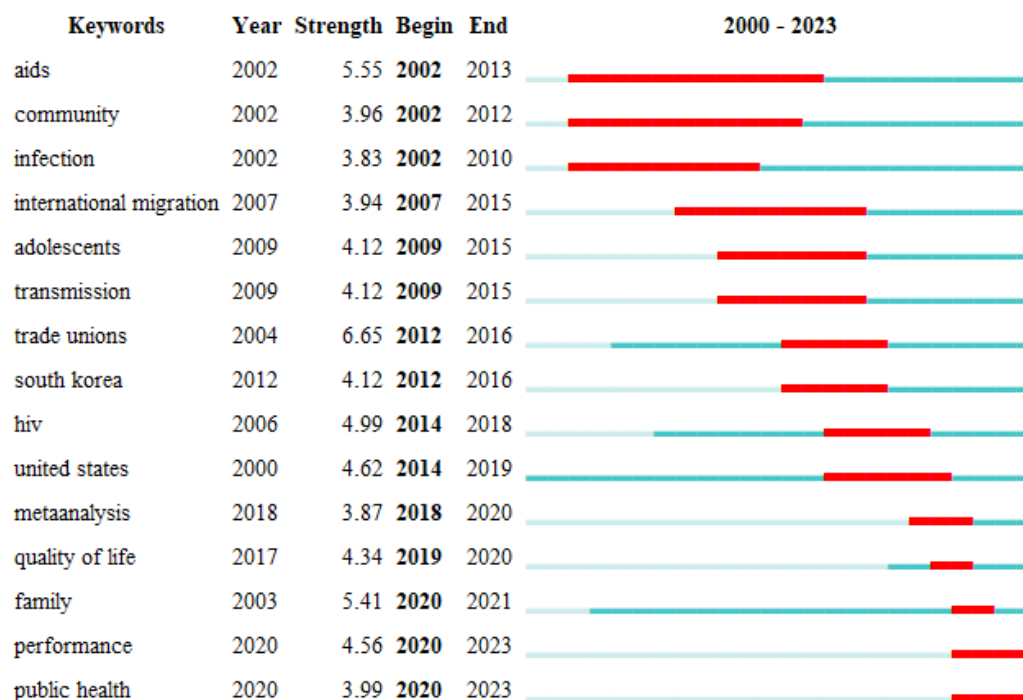


Figure 10. Top keywords with the strongest citation burst

Discussion

Knowledge framework

After an in-depth analysis of the four aspects (statistical analysis, collaboration analysis, co-citation analysis, and co-occurrence analysis) via CiteSpace, we have obtained abundant results, leaving a macro understanding of this term. In order to show these results more clearly, it is necessary to establish a relatively integrated knowledge framework (Yan et al., 2024) (Fig. 11).

The knowledge framework consists of four dimensions: knowledge base, authority objects, research frontiers, and future hotspots of migrant workers, addressing the study's four research questions. "Knowledge base" answers the question: Is it popular and important? "Authority object" identifies collaborative status and authoritative figures in migrant worker studies. "Research Frontiers" examines co-citation patterns to identify key contributors and answer: Who are the authorities? "Future Hot Spots" predicts upcoming research trends by analyzing co-occurring information to determine which topics will become mainstream.

(1) Statistical analysis is the knowledge base and plays a fundamental role. The results depict the publication trend of the term and the most popular journals and categories to help scholars better understand the popularity of this term and provide guidance for future submissions. Specifically, the most popular journals in this term are "International Journal of Environmental Research and Public Health," "International Migration," and "PLoS One." The articles can be classified into three categories: public environmental occupational health, sociology, and demography.

(2) Collaboration analysis focuses on the authors, institutions, and regions collaborating in the "migrant workers" academic papers published in the last 2 decades in the selected database. CiteSpace suggests that Hall BJ and Lee H are the authors who

collaborated most actively. The University of London and the N8 Research Partnership are the most collaborative institutions in this area. In terms of cooperation regions, the most prominent are People R China and the USA.



Figure 11. Knowledge framework

(3) Co-citation analysis explores authors, references, and journals most commonly cited in the term in the selected database. Specifically, Anderson B and Wong DFK are the authors who co-cited the most. From the co-cited references, the themes are mainly about

the occupational safety and health of migrant workers. The leading co-cited journals are “Journal of Ethnic and Migration Studies” and “International Migration Review.”

(4) Co-occurrence analysis analyzes the critical information that appears widely in the selected literature, such as literature category, keywords, and burst words. Specifically, the essential co-occurring categories are public environmental occupational health, and sociology. The most popular co-occurrence keywords are “migrant worker” and “migration.” The latest bursting keywords are “performance” and “public health,” which may be the hottest research topics in the future.

Based on the above summary, scholars can get corresponding inspiration and conduct more in-depth research in the future.

Research implications and discussion

Research implications

This paper analyzes 1807 articles on “migrant workers” from the past 24 years, uncovering future research trends and helping scholars identify valuable hotspots. The research implications include:

(1) This paper analyzes the progress of “migrant workers” research in SCIE, SSCI and AHCI in the recent two decades in a multidimensional and visualized way, which helps scholars to understand this term’s progress and status intuitively.

(2) This paper constructs a knowledge framework by expressing critical information about this term, which is clear and concise to help readers quickly understand the core content of the whole logical structure.

(3) This paper depicts future research directions and characteristics by summarizing involving fields, authoritative stakeholders, research frontiers, and critical hotspots, which saves scholars time in future research.

Research discussion

Migrant workers encounter various health, technological, economic, and social challenges. Comprehensive theoretical and applied research is needed to address these dilemmas. Therefore, we propose that studies on migrant workers should concentrate on three key areas.

(1) Physical health and mental health

Physical health and mental health have been a hot topic in the last 24 years and will continue to be of concern in the future. As for physical health, studies indicate a high prevalence of infectious diseases (e.g., duodenal hookworm, malaria, AIDS, COVID-19) in this group. As for mental health, mental health concerns have centered on depression and acculturative stress. The health challenges vary by geography and time, reflecting broader social issues such as inequities in social status, medical insurance differences, and variations in welfare benefits. Recent research highlights the positive influence of social support on the health behaviors of migrant workers (Hanna and Youngsuk, 2024), with organizational support proving effective for their safety and well-being (Peruzzi, 2020). Thus, societal recognition and policy support are essential for safeguarding the physical and mental health of migrant workers.

Therefore, future research can combine medicine and sociology to explore the association between physical health and mental health. Moreover, researchers can study

how government policies can effectively support the physical health and enhance social acceptance of migrant workers by integrating public administration and sociology. Finally, we suggest future studies can analyze the impact of organizational management practices and leadership styles on the mental health of migrant workers by combining management and sociology.

(2) Technological impact and economic development

Technological impacts are primarily seen in how the digital economy, artificial intelligence, and Internet technology affect migrant workers. Research indicates that scholars are increasingly examining the influence of the digital economy on migrant workers' career choices, quality of life, and working conditions (Xia et al., 2024; Guang, 2021). For domestically relocated migrant workers, the digital economy has created online odd jobs, transforming traditional work patterns. This is particularly beneficial for female migrant workers, as technology enhances economic modeling visualization and supports decision-making (Kunpeuk et al., 2017). For internationally migrating workers, host countries' digital technologies attract more foreign labor (Jingjing and Jun, 2023). Thus, countries should prioritize developing digital technologies related to migrant workers to draw talent from abroad.

Economic development is influenced by labor mobility. This study shows that mobility enhances individual human capital, narrows the labor price gap (Xiaoyun and Chunyan, 2022), and fosters regional economic growth (Zhengyan, 2023). Although returning entrepreneurs face financing challenges and a poor business environment, migrant workers' entrepreneurship still boosts the local economy. Therefore, we recommend that regional governments focus on migrant worker mobility and create suitable incentives and protections.

Future research can examine how digital technology, Internet technology, and artificial intelligence affect migrant workers' employment forms, migration willingness, and job security by integrating electronic information and sociology disciplines. Additionally, it can combine economics and public management to assess the impact of migrant mobility on regional human capital quality and quantity, as well as the influence of their entrepreneurship on local government management efficiency.

(3) Social support

Social support for migrant workers is primarily categorized into organizational and policy support. In terms of organizational support, co-citation analysis indicates that organizations like trade unions and the United Nations Migrant Workers Convention impact migrant workers' social status, rights, public health, living standards, and employment. In terms of policy support, research has shifted from macro-level national strategies to micro-level issues such as housing, health insurance, and employment assistance. At the macro level, China's "common prosperity" strategy aims to enhance income and welfare for migrant workers. Similarly, Germany's Skilled Migration Act seeks to attract skilled migrants globally. Russia has also introduced incentives to draw domestic and foreign migrants to its Far East region. Recent micro studies highlight that a robust social security system can ensure migrant workers' well-being (Cámara, 2022), while language education aids their communication with locals for better social support (Yuin, 2019). Thus, social support is crucial in addressing the real challenges faced by migrant workers.

Future research could integrate pedagogy and sociology to explore how language adaptation, language technology, and family education affect the social integration and well-being of migrant workers. We also encourage the government to create educational programs for migrant workers, including language, cultural, and family education.

Research limitations and future research directions

Research limitations

The limitations include:

(1) The data period is from 2000 to 2023, meaning that some traditional representative papers and newly published ones are yet to be included. For instance, we need to omit the historical study of migration workers, such as the mass migration during colonialism in the Roman Empire period, famine-driven migration, the triangular trade in slavery, and the gold rushes in the Americas and Africa. Papers about these topics impact subsequent social and economic problems and opportunities faced both by migrant workers and the host populations.

(2) We failed to analyze the funded projects worldwide, though we admit that funding units and projects worldwide are important because they accelerate collaboration. We do not analyze the funding primarily because the software CiteSpace does not yet support funding analysis.

(3) The research object, namely the research term, is relatively semantically limited. We strictly limit our research to the semantic term “migrant workers”, aiming to exclude less relevant terms and to focus highly on this topic. However, we have to admit that some scholars and researchers may be ignored only because they tend not to use the term “migrant workers” semantically. Besides, some topics such as the social and economic conditions of “migrant workers”, may be excluded because of the potential keyword searching strategy: sociology and economy scholars may use the semantic term “migrant workers” less frequently.

(4) In this paper, we cannot consistently and coherently handle the relations and differences among the parts of the federal university (such as the University of London, which is a federation with 17 institutions). Some analyses are linked to the component institutions, and some are linked to the federal body, which may confuse readers about their roles in research. Honestly speaking, the software neither separately identify which papers are from individual component institutions, nor only identify those papers are from the federal body as a whole; the software may automatically show both the component institutions and the federal body in a single figure based on the quantitative analysis results, which is relatively confusing. The “Federal University” issue is primarily because of the data limitation in the Web of Science and the information process limitation of CiteSpace. We hereby highlight this caveat to indicate this limitation.

Future research directions

Future research will try to solve the above limitations.

(1) Selecting a larger time span. We will analyze the literatures related to migrant workers over a longer time span to better understand the evolution of this group by reviewing historical studies.

(2) Enriching bibliometric tools. We will learn more bibliometric tools, such as HistCite, VOSviewer, and R language, to explore the motivations of authors to work with organizations from a funding perspective.

(3) Incorporating of additional terms. Previously, “migrant workers” were subdivided into groups by geographic area (e.g., rural migrant workers). However, the term has been subdivided and explored more accurately by occupation recently, such as “mobile workers,” “mobile care workers,” “mobile domestic workers,” “mobile agricultural workers,” and so on. This is because emerging migrant workers in diversified occupations have different problems and thus require segmented research. In the future, we will take differentiated migrant workers as the research object and establish a migrant worker occupation rating scale based on indicators such as income, social status, and skill requirements to discover new characteristics.

(4) Clarifying the definition of University of London. We need to clarify the relationships and differences between the University of London and its member organizations through the node merging technique. We believe that future research will further reveal the nuanced experiences of different groups in diverse contexts.

Author contributions. Conceptualization, Y.G.; methodology, Y.G.; software, J.L.; validation, J.L.; data processing, J.L.; data analysis, J.L.; data curation, J.L.; writing—original draft preparation, C.L. and Y.G.; writing—review and editing, Y.Y., X.J., and J.G.; visualization, C.L.; supervision, Y.Y.; project administration, Y.Y.; funding acquisition, Y.Y.

Acknowledgements. This research is funded by Education and Scientific Research Project of Shanghai (C2024248), Shanghai Dianji University for postgraduates’ education (A1-0225-23-011-02-012), Shanghai Key Curriculum Construction Project (Micro-economics).

Conflict of interest. The authors declare no conflict of interest.

Data availability. Data will be available upon request.

REFERENCES

- [1] AB Hamid, Z., Shukor, S. F. A., Mohamed, A. A. A. (2018): Rights of migrant workers under Malaysian employment law. – *Journal of East Asia and International Law* 11(2): 359-74.
- [2] Aktas, E., Bergbom, B., Godderis, L., Kreshpaj, B., Marinov, M., Mates, D., McElvenny, D. M., Mehlum, I. S., Milenkova, V., Nena, E., Glass, D. C. (2022): Migrant workers occupational health research: an OMEGA-NET working group position paper. – *International Archives of Occupational and Environmental Health* 95(4): 765-77.
- [3] Alahmad, B., Kurdi, H., Colonna, K., Gasana, J., Agnew, J., Fox, M. A. (2020): COVID-19 stressors on migrant workers in Kuwait: cumulative risk considerations. – *BMJ Global Health* 5(7): 5.
- [4] Alberti, G. (2014): Mobility strategies, ‘mobility differentials’ and ‘transnational exit’: the experiences of precarious migrants in London’s hospitality jobs. – *Work Employment and Society* 28(6): 865-81.
- [5] Alberti, G., Però, D. (2018): Migrating industrial relations: migrant workers’ initiative within and outside trade unions. – *British Journal of Industrial Relations* 56(4): 693-715.
- [6] Amrith, M. (2022): The temporal borders of transnational belonging: aging migrant domestic workers in Singapore. – *American Behavioral Scientist* 66(14): 1912-27.
- [7] Anderson, B. (2010): Mobilizing migrants, making citizens: migrant domestic workers as political agents. – *Ethnic and Racial Studies* 33(1): 60-74.
- [8] Anderson, B. (2014): Nations, migration and domestic labor: the case of the UK. – *Women’s Studies International Forum* 46: 5-12.
- [9] Andrzejewska, J., Rye, J. F. (2012): Lost in transnational space? Migrant farm workers in rural districts. – *Mobilities* 7(2): 247-68.

- [10] Ang, L. W., Gao, Q., Cui, L., Farwin, A., Toh, M. P. H. S., Boudville, I. C., Chen, M. I. C., Chow, A., Lin, R. T. P., Lee, V. J. M., Leo, Y. S. (2022a): Prevalence of measles antibodies among migrant workers in Singapore: a serological study to identify susceptible population subgroups. – *BMC Infectious Disease* 22(1): 7.
- [11] Ang, L. W., Gao, Q., Cui, L., Farwin, A., Toh, M. P. H. S., Boudville, I. C., Chen, M. I. C., Chow, A., Lin, R. T. P., Lee, V. J. M. (2022b): Seroprevalence of IgG antibodies against diphtheria antitoxin among migrant workers in Singapore, 2016-2019. – *BMC Public Health* 22(1): 8.
- [12] Arieli, D., Yassour-Borochowitz, D. (2023): Decent care and decent employment: family caregivers, migrant care workers and moral dilemmas. – *Ethics and Behavior* 13: 314-326.
- [13] Arora, S., Majumder, M. (2021): Where is my home? Gendered precarity and the experience of COVID-19 among women migrant workers from Delhi and National Capital Region, India. – *Gender Work and Organization* 28: 307-20.
- [14] Ayalon, L., Rapoliene, G. (2022): Changes in attitudes toward aging, older people and elder care from the perspective of former migrant care workers. – *Research on Aging* 44(7-8): 611-8.
- [15] Baig, R. B., Chang, C. W. (2020): Formal and informal social support systems for migrant domestic workers. – *American Behavioral Scientist* 64(6): 784-801.
- [16] Bal, C. S., Gerard, K. J. T. W. Q. (2018): ASEAN's governance of migrant worker rights. – *Third World Quarterly* 39(4): 799-819.
- [17] Boucher, A. (2019): Measuring migrant worker rights violations in practice: the example of temporary skilled visas in Australia. – *Journal of Industrial Relations* 61(2): 277-301.
- [18] Boucher, A. K., Wright, C. F. (2023): Hard exterior, soft interior: skill regulation and employer control over migrant worker selection policy in Australia. – *Industrial Law Journal* 52(4): 899-929.
- [19] Bruckova, M., Bautista, C. T., Graham, R. R., Maly M., Vandasova, J., Presl, J. Sumegh, L., Chapman, G. D., Carr, J. K., Sanchez, J. L., Earhart, K. C. (2006): Short report: HIV infection among commercial sex workers and injecting drug users in the Czech Republic. – *The American Journal of Tropical Medicine and Hygiene* 75(5): 1017-20.
- [20] Buat, C. (2020): Segmented possibilities: migrant life histories of Hindustani workers in post colonial India. – *International Labor and Working-Class History* 97: 134-58.
- [21] Busza, J., Baker, S. (2004): Protection and participation: an interactive programme introducing the female condom to migrant sex workers in Cambodia. – *Aids Care-Psychological and Socio-Medical Aspects of Aids-Hiv* 16(4): 507-18.
- [22] Cámbara, F. B. (2022): COVID-19 and women migrant workers in informal employment: recommendations for strengthening social protection efforts in Lao People's Democratic Republic. – *Gender & Development* 30(1-2): 97-113.
- [23] Cao, Y., Liu, Z. K. (2015): Poverty and health: children of rural-to-urban migrant workers in Beijing, China. – *Social Indicators Research* 123(2): 459-77.
- [24] Cha, S., Cho, Y. (2014): Fatal and non-fatal occupational injuries and diseases among migrant and native workers in South Korea. – *American Journal of Industrial Medicine* 57(9): 1043-52.
- [25] Chan, H. H. Y., Latham, A. (2022): Working and dwelling in a global city: going-out, public worlds, and the intimate lives of migrant domestic workers in Hong Kong. – *Journal of Ethnic and Migration Studies* 48(15): 3524-43.
- [26] Chen, J. (2011): Internal migration and health: re-examining the healthy migrant phenomenon in China. – *Social Science & Medicine* 72(8): 1294-301.
- [27] Chen, S. Q., Chen, Y. Y., Feng, Z. C., Chen, X., Wang, Z., Zhu, J. F., Jin, J., Yao, Q., Xiang, L., Yao, L., Sun, J., Zhao, L., Fung, H., Wong, E. L. Y., Dong, D. (2020): Barriers of effective health insurance coverage for rural-to-urban migrant workers in China: a systematic review and policy gap analysis. – *BMC Public Health* 20(1): 16.

- [28] Cheng, Z. M., Smyth, R., Guo, F. (2015): The impact of China's new Labour Contract Law on socioeconomic outcomes for migrant and urban workers. – *Human Relations* 68(3): 329-52.
- [29] Cho, H. J., Kang, K., Park, K. Y. (2023): Health-related quality of life of migrant workers: a systematic literature review. – *BMC Public Health* 23(1): 15.
- [30] Cordini, M., Ranci, C. (2017): Legitimising the care market: the social recognition of migrant care workers in Italy. – *Journal of Social Policy* 46(1): 91-108.
- [31] Daly, A., Carey, R. N., Darcey, E., Chih, H. J., LaMontagne, A. D., Milner, A., Reid, A. (2019): Using three cross-sectional surveys to compare workplace psychosocial stressors and associated mental health status in six migrant groups working in australia compared with Australian-born workers. – *International Journal of Environmental Research and Public Health* 16(5): 15.
- [32] De Leo, A., D'adamo, G., Morozzi, C., Gozzoli, C. (2023): Taking care of forced migrants together: strengths and weaknesses of interorganizational work from the perspective of social workers. – *International Journal of Environmental Research and Public Health* 20(2): 18.
- [33] Dutta, M. J. (2021): Singapore's extreme neoliberalism and the COVID outbreak: culturally centering voices of low-wage migrant workers. – *American Behavioral Scientist* 65(10): 1302-22.
- [34] Febres-Cordero, B., Brouwer, K. C., Rocha-Jimenez, T., Fernandez-Casanueva, C., Morales-Miranda, S., Goldenberg, S. M. (2018): Influence of peer support on HIV/STI prevention and safety amongst international migrant sex workers: a qualitative study at the Mexico-Guatemala border. – *PLoS One* 13(1): 20.
- [35] Ferreira, J. J. M., Fernandes, C. I., Ratten, V. (2016): A co-citation bibliometric analysis of strategic management research. – *Scientometrics* 109(1): 1-32.
- [36] Forde, C., Mackenzie, R. (2009): Employers' use of low-skilled migrant workers Assessing the implications for human resource management. – *International Journal of Manpower* 30(5): 437-52.
- [37] Forde, C., Mackenzie, R. (2010): The ethical agendas of employment agencies towards migrant workers in the UK: deciphering the codes. – *Journal of Business Ethics* 97: 31-41.
- [38] Frenkel, S. J., Li, M., Restubog, S. L. D. (2012): Management, organizational justice and emotional exhaustion among Chinese migrant workers: evidence from two manufacturing firms. – *British Journal of Industrial Relations* 50(1): 121-47.
- [39] Fu, Z. H., Jiang, H. Q., Qiao, J. J., Jiang, X. J., He, W. C. (2023): Gender differences in migrant workers' wages and their influencing factors in the central hilly regions of China. – *Land* 12(7): 16.
- [40] Gan, X. L., Zuo, J., Ye, K. H., Li, D. Z., Chang, R. D., Zillante, G. (2016): Are migrant workers satisfied with public rental housing? A study in Chongqing, China. – *Habitat International* 56: 96-102.
- [41] Garabiles, M. R., Lao, C. K., Xiong, Y. X., Hall, B. J. (2019): Exploring comorbidity between anxiety and depression among migrant Filipino domestic workers: a network approach. – *Journal of Affective Disorders* 250: 85-93.
- [42] Garabiles, M. R., Lao, C. K., Wang, S. Y., Hall, B. J. (2020): The network structure of posttraumatic stress disorder among Filipina migrant domestic workers: comorbidity with depression. – *European Journal of Psychotraumatology* 11(1): 13.
- [43] Geng, Y. Q., Maimaituerxun, M. (2022a): Research progress of green marketing in sustainable consumption based on CiteSpace analysis. – *SAGE Open* 12(3): 19.
- [44] Geng, Y. Q., Zhu, R. J., Maimaituerxun, M. (2022b): Bibliometric review of carbon neutrality with CiteSpace: evolution, trends, and framework. – *Environmental Science and Pollution Research* 29(51): 76668-86.
- [45] Geng, Y. Q., Zhang, N. G., Zhu, R. J. (2023a): Research progress analysis of sustainable smart grid based on CiteSpace. – *Energy Strategy Review* 48: 17.

- [46] Geng, Y. Q., Chen, L. Y., Li, J. Y., Iqbal, K. (2023b): Higher education and digital Economy: analysis of their coupling coordination with the Yangtze River economic Belt in China as the example. – *Ecological Indicators* 154: 16.
- [47] Geng, Y. Q., Xiang, Q. J., Gao, J., Yan, Y., Li, J. (2024a): Progress and framework of clean energy production: bibliometric analysis from 2002 to 2022. – *Energy Strategy Review* 101270.
- [48] Geng, Y. Q., Xiang, Q. J., Zhang, N. G., Gao, J., Yan, Y. (2024b): Bibliometric analysis of microgrid control strategy from 2007 to 2022 based on CiteSpace. – *Electronic Power Component and System* 17: 5375-5406.
- [49] Goldenberg, S. M., Brouwer, K. C., Jimenez, T. R., Miranda, S. M., Mindt, M. R. (2016): Enhancing the ethical conduct of HIV research with migrant sex workers: human rights, policy, and social contextual influences. – *PLoS ONE* 11(5): 21.
- [50] Guang, C. (2021): Development of migrant workers in construction based on machine learning and artificial intelligence technology. – *Journal of Intelligent & Fuzzy Systems* 40(4): 6629-40.
- [51] Hall, B. J., Yip, P. S. Y., Garabiles, M. R., Lao, C. K., Chan, E. W. W., Marx, B. P. (2019): Psychometric validation of the PTSD Checklist-5 among female Filipino migrant workers. – *European Journal of Psychotraumatology* 26(2): 280-291.
- [52] Hanna, J., Youngsuk, K. (2024): Structural equation modeling of health promotion behavior on migrant workers: a multi-group analysis based on the period of residence. – *Journal of Korean Academy of Nursing* 54(1): 73-92.
- [53] Hargreaves, S., Rustage, K., Nellums, L. B., McAlpine, A., Pocock, N., Devakumar, D., Aldridge, R. W., Abubakar, I., Kristensen, K. L., Himmels, J. W., Friedland, J. S., Zimmerman, C. (2019): Occupational health outcomes among international migrant workers: a systematic review and meta-analysis. – *The Lancet. Global Health* 7(7): E872-E82.
- [54] He, X. S., Wong, D. F. K. (2013): A comparison of female migrant workers' mental health in four cities in China. – *International Journal of Social Psychiatry* 59(2): 114-22.
- [55] Hennebry, J. L., Preibisch, K. (2012): A model for managed migration? Re-examining best practices in Canada's seasonal agricultural worker program. – *International Migration* 50: e19-e40.
- [56] Hesketh, T., Li, L., Ye, X., Wang, H., Jiang, M., Tomkins, A. (2006): HIV and syphilis in migrant workers in eastern China. – *Sexually Transmitted Infections* 82(1): 11-4.
- [57] Hesketh, T., Jun, Y. X., Lu, L., Mei, W. H. (2008): Health status and access to health care of migrant workers in China. – *Public Health Reports* 123(2): 189-97.
- [58] Ho, K. H. M., Hung, M. S. Y., Zhang, Y. J., Bai, X., Cheung, D. S. K., Chow, M. C. M., Lee, P. H., Chien, W. T. (2023): The perceived relationship quality with migrant domestic workers is correlated with a lower level of loneliness among community-dwelling older adults: a cross-sectional study. – *Archives of Gerontology and Geriatrics* 109: 11.
- [59] Hovey, J. D., Magaña, C. G. (2002): Exploring the mental health of Mexican migrant farm workers in the Midwest: psychosocial predictors of psychological distress and suggestions for prevention and treatment. – *Journal of Psychology* 136(5): 493-513.
- [60] Huang, S., Yeoh, B. S. A., Toyota, M. (2012): Caring for the elderly: the embodied labour of migrant care workers in Singapore. – *Global Network* 12(2): 195-215.
- [61] Istiko, S. N., Durham, J., Elliott, L. (2022): A scoping review of migrant workers' access to health services and social protection during the COVID-19 pandemic in Australia, Canada, and New Zealand. – *International Journal of Environmental Research and Public Health* 19(5): 13.
- [62] Jiang, J. Y., Korczynski, M. (2023): The role of community organisations in the collective mobilisation of migrant workers: the importance of a 'community'-oriented perspective. – *Work Employment and Society* 19: 339-357.

- [63] Jingjing, L., Jun, X. (2023): How does overseas investment in the digital industry affect the digital innovation of Chinese enterprises? Evidence from digital patents of listed companies. – *World Economy Studies* 12: 58-73 + 133.
- [64] Jirattikorn, A., Tangmunkongvorakul, A., Ayuttacorn, A., Banwell, C., Kelly, M., Lebel, L., Srithanaviboonchai, K. (2022): Shan migrant sex workers living with HIV who remain active in sexual entertainment venues in Chiang Mai, Thailand. – *Journal of Racial and Ethnic Health Disparities* 9(5): 1616-25.
- [65] Kiang, L., Grzywacz, J. G., Marín, A. J., Arcury, T. A., Quandt, S. A. (2010): Mental health in immigrants from nontraditional receiving sites. – *Cultural Diversity & Ethnic Minority Psychology* 16(3): 386-94.
- [66] Koh, D. (2020): Migrant workers and COVID-19. – *Occupational and Environmental Medicine* 77(9): 634-6.
- [67] Kunpeuk, W., Julchoo, S., Phaiyaron, M., Sinam, P., Pudpong, N., Loganathan, T., Yi, H. S., Suphanchaimat, R. (2022): Access to healthcare and social protection among migrant workers in Thailand before and during COVID-19 era: a qualitative study. – *International Journal of Environmental Research and Public Health* 19(5): 16.
- [68] Kusriani, K., Purwanto, M. I., Kirana, K. C., Laksito, A. D. (2017): GIS technology selection for visualization of independent economic modeling of former woman migrant worker (WMW). – *Proceedings of the 5th International Conference on Cyber and IT Service Management (CITSM)*, Denpasar, Indonesia, F Aug 08-10. IEEE, New York.
- [69] Lai, Y. T., Fong, E. (2020): Work-related aggression in home-based working environment: experiences of migrant domestic workers in Hong Kong. – *American Behavioral Scientist* 64(6): 722-39.
- [70] Lam, T., Yeoh, B. S. A. (2018): Migrant mothers, left-behind fathers: the negotiation of gender subjectivities in Indonesia and the Philippines. – *Gender Place and Culture* 25(1): 104-17.
- [71] Li, D., Zhu, L., Zhang, J., Yang, J. J. (2021a): Decomposing differences of health service utilization among Chinese rural migrant workers with new cooperative medical scheme: a comparative study. – *International Journal of Environmental Research and Public Health* 18(17): 14.
- [72] Li, D., Zhai, S. G., Zhang, J., Yang, J. J., Wang, X. (2021b): Assessing income-related inequality on health service utilization among Chinese rural migrant workers with new co-operative medical scheme: a multilevel approach. – *International Journal of Environmental Research and Public Health* 18(20): 18.
- [73] Li, L., Wang, H. M., Ye, X. J., Jiang, M. M., Lou, Q. Y., Hesketh, T. (2007): The mental health status of Chinese rural-urban migrant workers. – *Social Psychiatry and Psychiatric Epidemiology* 42(9): 716-22.
- [74] Li, Z., Dai, J. M., Wu, N., Gao, J. L., Fu, H. (2019): The mental health and depression of rural-to-urban migrant workers compared to non-migrant workers in Shanghai: a cross-sectional study. – *International Health* 11: S55-S63.
- [75] Liew, J. A., Yeoh, B. S. A., Huang, S., Ho, E. (2020): Tuning care relations between migrant caregivers and the elderly in Singapore. – *Asia Pacific Viewpoint* 61(3): 438-52.
- [76] Liu, Q., Pan, H. M. (2020): Investigation on life satisfaction of rural-to-urban migrant workers in china: a moderated mediation model. – *International Journal of Environmental Research and Public Health* 17(7): 14.
- [77] Long, R. S., Chen, H., Hu, T., Chen, Y. Q., Cao, B. L., Wang, R. X., Hu, F., Xu, C., Yu, X. Y., Liu, Y. J., Liu, S. B., Zhang, K. C., Zou, H. C., Wang, Z. X., Xue, W. J., Cai, Y. (2022): The association between entrapment and depression among migrant workers in China: a social rank theory based study. – *BMC Psychiatry* 22(1): 9.
- [78] Lu, G. Y., Cao, Y. Y., Chen, Q., Zhu, G. D., Müller, O., Cao, J. (2022): Care-seeking delay of imported malaria to China: implications for improving post-travel healthcare for migrant workers. – *Journal of Travel Medicine* 29(4): 9.

- [79] Ma, H. Y., Barbe, F. T., Zhang, Y. C. (2018): Can social capital and psychological capital improve the entrepreneurial performance of the new generation of migrant workers in China? – *Sustainability* 10(11): 16.
- [80] Mackenzie, R., Forde, C. (2009): The rhetoric of the ‘good worker’ versus the realities of employers’ use and the experiences of migrant workers. – *Work Employment and Society* 23(1): 142-59.
- [81] Marino, S. (2015): Trade unions, special structures and the inclusion of migrant workers: on the role of union democracy. – *Work Employment and Society* 29(5): 826-42.
- [82] Matteelli, A., Beltrame, A., Carvalho, A. C. C., Casalini, C., Forleo M. A., Gulletta, M., El-Hamad, I., Pollara, C., Tedoldi, S., Carasi, S., Carosi, G. (2003): Chlamydia trachomatis genital infection in migrant female sex workers in Italy. – *International Journal of STD & AIDS* 14(9): 591-5.
- [83] Meyer, S. R., Robinson, W. C., Branchini, C., Abshir, N., Mar, A. A., Decker, M. R. (2019): Gender differences in violence and other human rights abuses among migrant workers on the Thailand-Myanmar border. – *Violence Against Women* 25(8): 945-67.
- [84] Mo, P. K. H., Cheng, Y., Lau, J. T. F. (2022): Work-related factors on mental health among migrant factory workers in China: application of the demand-control and effort-reward imbalance model. – *Health & Social Care in the Community* 30(2): 656-67.
- [85] Mou, J., Cheng, J. Q., Zhang, D., Jiang, H. P., Lin, L. Q., Griffiths, S. M. (2009): Health care utilisation amongst Shenzhen migrant workers: does being insured make a difference? – *BMC Health Services Research* 9: 9.
- [86] Moyce, S. C., Schenker, M. (2018): Migrant workers and their occupational health and safety. – *Annual Review of Public Health* 39: 351-65.
- [87] Mucci, N., Traversini, V., Giorgi, G., Tommasi, E., De Sio, S., Arcangeli, G. (2020): Migrant workers and psychological health: a systematic review. – *Sustainability* 12(1): 28.
- [88] Mustchin, S. (2012): Unions, learning, migrant workers and union revitalization in Britain. – *Work Employment and Society* 26(6): 951-67.
- [89] Musumari, P. M., Chamchan, C. (2016): Correlates of HIV testing experience among migrant workers from Myanmar residing in Thailand: a secondary data analysis. – *PLoS One* 11(5): 19.
- [90] Nappo, N. (2022): Self-perceived job insecurity and self-reported health: differences between native-born and migrant workers based on evidence from the Sixth European Working Conditions Survey. – *PLoS ONE* 17(4): 14.
- [91] Nyunt, M. H., Aye, K. M., Kyaw, M. P., Kyaw, T. T., Hlaing, T., Oo, K., Zaw, N. N., Aye, T. T., San, N. A. (2014): Challenges in universal coverage and utilization of insecticide-treated bed nets in migrant plantation workers in Myanmar. – *Malaria Journal* 13: 7.
- [92] O’connor, S. Y., Tangmunkongvorakul, A., Srithanaviboonchai, K., Sripan, P., Banwell, C., Kelly, M. (2022): Association between sociodemographic factors and condom use among migrant sex workers in Chiang Mai, Northern Thailand. – *International Journal of Environmental Research and Public Health* 19(16): 14.
- [93] Oliva-Arocas, A., Benavente, P., Ronda, E., Diaz, E. (2022): Health of international migrant workers during the COVID-19 pandemic: a scoping review. – *Frontiers in Public Health* 10: 9.
- [94] Page, M. J., Mckenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E. (2021): The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. – *British Medical Journal* 372: n71.
- [95] Parrenas, R. (2021): The mobility pathways of migrant domestic workers. – *Journal of Ethnic and Migration Studies* 47(1): 3-24.
- [96] Parreñas, R. S. (2021): Discipline and empower: the state governance of migrant domestic workers. – *American Sociological Review* 23.

- [97] Pega, F., Govindaraj, S., Tran, N. T. (2021): Health service use and health outcomes among international migrant workers compared with non-migrant workers: a systematic review and meta-analysis. – *PLoS ONE* 16(6): 18.
- [98] Pérez, E. R., Benavides, F. G., Levecque, K., Love, J. G., Felt, E., Van Rossem, R. (2012): Differences in working conditions and employment arrangements among migrant and non-migrant workers in Europe. – *Ethnicity & Health* 17(6): 563-77.
- [99] Peruzzi, M. (2020): Organisational and management models as a means of ensuring the effectiveness of the rules protecting the health of migrant workers. – *Insecure Work*. Il Mulino 135-50.
- [100] Pham, K. T. H., Nguyen, L. H., Vuong, Q. H., Ho, M. T., Vuong, T. T., Nguyen, H. K. T., Vu, G. T., Nguyen, H. L. T., Tran, B. X., Latkin, C. A. (2019): Health inequality between migrant and non-migrant workers in an industrial zone of Vietnam. – *International Journal of Environmental Research and Public Health* 16(9): 11.
- [101] Preibisch, K., Otero, G. (2014): Does citizenship status matter in Canadian Agriculture? Workplace health and safety for migrant and immigrant laborers. – *Rural Sociology* 79(2): 174-99.
- [102] Puri, M., Cleland, J. (2006): Sexual behavior and perceived risk of HIV/AIDS among young migrant factory workers in Nepal. – *Journal of Adolescents Health* 38(3): 237-46.
- [103] Reid, A., Daly, A., Lamontagne, A. D., Milner, A., Pérez, E. R. (2020): Descriptive study of workplace demand, control and bullying among migrant and Australian-born workers by gender: does workplace support make a difference? – *BMJ Open* 10(6): 10.
- [104] Ren, J. Y., Xu, Z. T., Hu, M. Z. (2023): Digital economy and settlement intention of migrants in urban China. – *Telecommun Policy* 47(10): 14.
- [105] Ronda-Perez, E., Gosslin, A., Martínez, J. M., Reid, A. (2019): Injury vulnerability in Spain. Examination of risk among migrant and native workers. – *Safety Science* 115: 36-41.
- [106] Ruhs, M., Anderson, B. (2010): Semi-compliance and illegality in migrant labour markets: an analysis of migrants, employers and the state in the UK. – *Popul Space Place* 16(3): 195-211.
- [107] Rydzik, A., Anitha, S. (2020): Conceptualising the agency of migrant women workers: resilience, reworking and resistance. – *Work Employment and Society* 34(5): 883-99.
- [108] Sadarangani, S. P., Lim, P. L., Vasoo, S. (2017): Infectious diseases and migrant worker health in Singapore: a receiving country's perspective. – *Journal of Travel Medicine* 24(4): 9.
- [109] Sahimin, N., Lim, Y. A. L., Douadi, B., Khalid, M. K. N. M., Wilson, J. J., Behnke, J. M., Zain, S. N. M. (2017): Hookworm infections among migrant workers in Malaysia: molecular identification of *Necator americanus* and *Ancylostoma duodenale*. – *Acta Tropica* 173: 109-15.
- [110] Sandberg, J. C., Nguyen, H. T., Quandt, S. A., Chen, H. Y., Summers, P., Walker, F. O., Arcury, T. A. (2016): Sleep quality among Latino farmworkers in North Carolina: examination of the job control-demand-support model. – *Journal of Immigrant and Minority Health* 18(3): 532-41.
- [111] Saparamadu, A., Sharpe, A., Kim, S., Barbosa, B. L. F. A., Pereira, A. (2021): Low-wage migrant workers during coronavirus disease 2019: a social determinants analysis. – *Journal of Public Health Policy* 42(3): 452-64.
- [112] Shaffer, F. A., Alvarez, T. D., Stievano, A. (2022): Guaranteeing dignity and decent work for migrant nurses and health care workers beyond the COVID-19 pandemic. – *Journal of Nursing Management* 30(8): 3918-21.
- [113] Simkhada, P., Van Teijlingen, E., Gurung, M., Wasti, S. P. (2018): A survey of health problems of Nepalese female migrants workers in the Middle-East and Malaysia. – *BMC International Health and Human Rights* 18: 7.

- [114] Simmons, C., Rodrigues, R., Szebehely, M. (2022): Working conditions in the long-term care sector: a comparative study of migrant and native workers in Austria and Sweden. – *Health & Social Care in the Community* 30(5): E2191-E202.
- [115] Siu, K. (2015): Continuity and change in the everyday lives of Chinese migrant factory workers. – *China Journal* 74: 43-65.
- [116] Spanger, M., Andersen, M. (2023): Convolutional mobility: on the precarious movements of transnational migrant workers. – *Journal of Ethnic and Migration Studies* 49(13): 3473-91.
- [117] Spiliopoulos, G., Cuban, S., Broadhurst, K. (2021): Migrant care workers at the intersection of rural belonging in small English communities. – *Journal of Immigrant & Refugee Studies* 19(2): 213-26.
- [118] Sterud, T., Tynes, T., Mehlum, I. S., Veiersted, K. B., Bergbom, B., Airila, A., Johansson, B., Brendler-Lindqvist, M., Hviid, K., Flyvholm, M. A. (2018): A systematic review of working conditions and occupational health among immigrants in Europe and Canada. – *BMC Public Health* 18: 15.
- [119] Surratt, H. (2007): Sex work in the Caribbean Basin: patterns of substance use and HIV risk among migrant sex workers in the US Virgin Islands. – *Aids Care-Psychological and Socio-Medical Aspects of AIDS-HIV* 19(10): 1274-82.
- [120] Tam, C. C., Khan, M. S., Legido-Quigley, H. (2016): Where economics and epidemics collide: migrant workers and emerging infections. – *Lancet* 388(10052): 1374-6.
- [121] Tang, S. S., Hao, P., Feng, J. X. (2020): Consumer behavior of rural migrant workers in urban China. – *Cities* 106: 10.
- [122] Tao, L., Hui, E. C. M., Wong, F. K. W., Chen, T. T. (2015): Housing choices of migrant workers in China: beyond the Hukou perspective. – *Habitat International* 49: 474-83.
- [123] Tapia, M., Alberti, G. (2019): Unpacking the category of migrant workers in trade union research: a multi-level approach to migrant intersectionalities. – *Work Employment and Society* 33(2): 314-25.
- [124] Thomas, A. (2020): Cross-border labour markets and the role of trade unions in representing migrant workers' interests. – *Journal of Industrial Relations* 62(2): 235-55.
- [125] Timonen, V., Doyle, M. (2010): Caring and collaborating across cultures? Migrant care workers' relationships with care recipients, colleagues and employers. – *European Journal of Women's Studies* 17(1): 25-41.
- [126] Underhill, E., Huang, S., Yi, S., Rimmer, M. (2019): Using social media to improve temporary migrant workers' access to information about their employment rights. – *Journal Of Australian Political Economy* 84: 147-74.
- [127] Urrego-Parra, H. N., Rodriguez-Guerrero, L. A., Pastells-Peiró, R., Mateos-García, J. T., Gea-Sanchez, M., Escrig-Piñol, A., Briones-Vozmediano, E. (2022): The health of migrant agricultural workers in Europe: a scoping review. – *Journal of Immigrant and Minority Health* 24(6): 1580-9.
- [128] Van Hightower, N. R., Gorton, J., Demoss, C. L. (2000): Predictive models of domestic violence and fear of intimate partners among migrant and seasonal farm worker women. – *Journal of Family Violence* 15(2): 137-54.
- [129] Wang, R. X., Chen, Y. X., Hu, F., Wang, Z. X., Cao, B. L., Xu, C., Yu, X. Y., Chang, R. J., Wang, H. W., Chen, H., Liu, Y. J., Liu, S. B., Hu, T., Chen, Y. Q., Zhang, K. C., Zou, H. C., Cai, Y. (2021): Psychometric properties of interpersonal needs Questionnaire-15 for predicting suicidal ideation among migrant industrial workers in China. – *International Journal of Environmental Research and Public Health* 18(14): 13.
- [130] Wang, W., Fan, C. C. (2012): Migrant workers' integration in urban China: experiences in employment, social adaptation, and self-identity. – *Eurasian Geography and Economics* 53(6): 731-49.
- [131] Wong, D. F. K., Li, C. Y., Song, H. X. (2007): Rural migrant workers in urban China: living a marginalised life. – *International Journal of Social Welfare* 16(1): 32-40.

- [132] Wong, M. C. P., Tan, C. S., Chan, A. Y., Khaled, N., Hasan, M. T., Panchapakesan, C., Tripathi, S., Afsana, K., Lwin, M. O., Chen, M. I. C., Hildon, Z. J. L. (2022): Exploring COVID-19 circuit breaker (CB) restrictions at a migrant worker dormitory in Singapore: a case study and nested mixed-method analysis of stress management and mental health. – *BMJ Open* 12(8): 10.
- [133] Wright, C. F., Groutsis, D., Kaabel, A. (2022): Regulating migrant worker temporariness in Australia: the role of immigration, employment and post-arrival support policies. – *Journal of Ethnic and Migration Studies* 48(16): 3947-64.
- [134] Wu, H. J., Wu, Q. C. (2021): The geography of migrant workers' income in China: evidence from a migrants dynamic survey in 2017. – *Growth Change* 52(3): 1826-51.
- [135] Xia, X. Q., Zhu, M. B., Fan, W. Y., Wu, Z. K. (2024): Digital economy and income of migrant workers from rural China. – *Applied Economics Letters* 4: 344-368.
- [136] Xiao, J., Yang, G., Xie, S., Zhao, X. (2024a): The boon and bane of authoritarian leadership: an impression management perspective investigating the differential effects of authoritarian leadership on employee outcomes. – *Current Psychology* 43:19676-19698.
- [137] Xiao, J., Yan, Y., Li, B., Liu, S. (2024b): Leading by example: understanding the trickle-down effect of voluntary green behavior in the workplace. – *Journal of Managerial Psychology* 39(5): 613-927.
- [138] Xiaoyun, W., Chunyan, M. (2022): The cross-border inflow of labor force in the China-Myanmar border area and its causes under the background of the construction of China-Myanmar Economic Corridor. – *Trade Fair Economy* 9: 21-3.
- [139] Xue, Z. X., Li, B. W. (2022): The impact of the integration of urban and rural medical insurance on migrant workers' overwork: evidence from China. – *Frontiers in Public Health* 10: 14.
- [140] Yan, Y., Deng, D., Geng, Y., Gao, J., Lin, E. (2023a): The dual influence path of decent work perception on employee innovative behavior. – *Frontiers in Psychology* 14: 1302945.
- [141] Yan, Y., Geng, Y. Q., Gao, J. (2023b): Measuring the decent work of knowledge workers: constructing and validating a new scale. – *Heliyon* 9(7): 13.
- [142] Yan, Y., Gao, J., Jiang, X., Geng, Y., Lin, E. (2024): A Study on a new 5S model of decent work perception. – *Sustainability* 16(3): 1207.
- [143] Yang, G., Zhou, C. S., Jin, W. F. (2020): Integration of migrant workers: differentiation among three rural migrant enclaves in Shenzhen. – *Cities* 96: 13.
- [144] Yang, H., Li, X., Stanton, B., Fang, X., Lin, D., Mao, R., Liu, H., Chen, X., Severson, R. (2005): Workplace and HIV-related sexual behaviours and perceptions among female migrant workers. – *Aids Care-Psychological and Socio-Medical Aspects of Aids-Hiv* 17(7): 819-33.
- [145] Yang, H., Gao, J., Wang, T. H., Yang, L. H., Liu, Y., Shen, Y., Gong, J., Dai, W., Zhou, J., Gu, J., Pan, Z. G., Zhu, S. Z. (2017): Association between adverse mental health and an unhealthy lifestyle in rural-to-urban migrant workers in Shanghai. – *Journal of The Formosan Medical Association* 116(2): 90-8.
- [146] Yang, Y. F., Chen, B., Huang, P., Wang, Y. X., Zhang, L. P., Cai, F. M. (2022): Prevalence and influencing factors of depressive symptoms among rural-to-urban migrant workers in China: a systematic review and meta-analysis. – *Journal of Affective Disorders* 307: 11-9.
- [147] Yue, Z. S., Fong, E., Yuan, Y., Li, S. Z. (2019): Life satisfaction and internal migration experience: migrant workers in Guangzhou, China. – *Asian Population Studies* 15(3): 302-18.
- [148] Yuin, L. (2019): A review of policies to improve migrant workers' language skills language education for migrant workers in the Netherlands. – *Journal of the International Network for Korean Language and Culture* 16(1): 261-96.

- [149] Zhengyan, G. (2023): Coupling mechanism between rural migrant workers returning home to start businesses and county economic development. – *The Journal of Shandong Agriculture and Engineering University* 40(11): 70-4.
- [150] Zhong, B. L., Liu, T. B., Huang, J. X., Fung, H. H., Chan, S. S. M., Conwell, Y., Chiu, H. F. K. (2016): Acculturative Stress of Chinese rural-to-urban migrant workers: a qualitative study. – *PLoS ONE* 11(6): 15.
- [151] Zhong, B. L., Liu, T. B., Chan, S. S. M., Jin, D., Hu, C. Y., Dai, J., Chiu, H. F. K. (2018): Common mental health problems in rural-to-urban migrant workers in Shenzhen, China: prevalence and risk factors. – *Epidemiol Psychiatr Sc* 27(3): 256-65.
- [152] Zou, J., Deng, X. J. (2020): Return intention, subjective social status and residential choices of rural migrant worker households: evidence from China. – *Housing Theory & Society* 37(4): 417-38.

APPENDIX

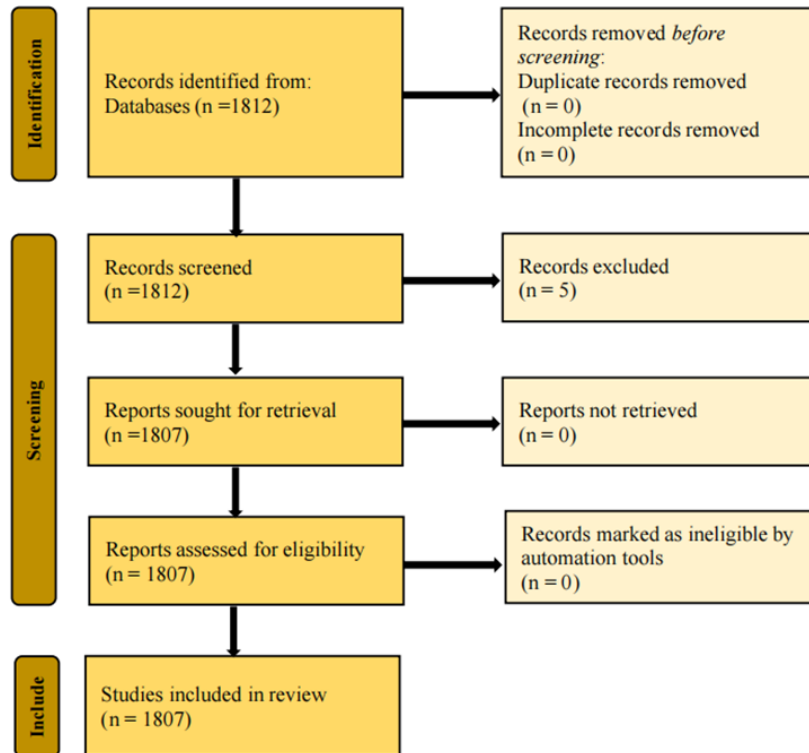


Figure A1. PRISMA process

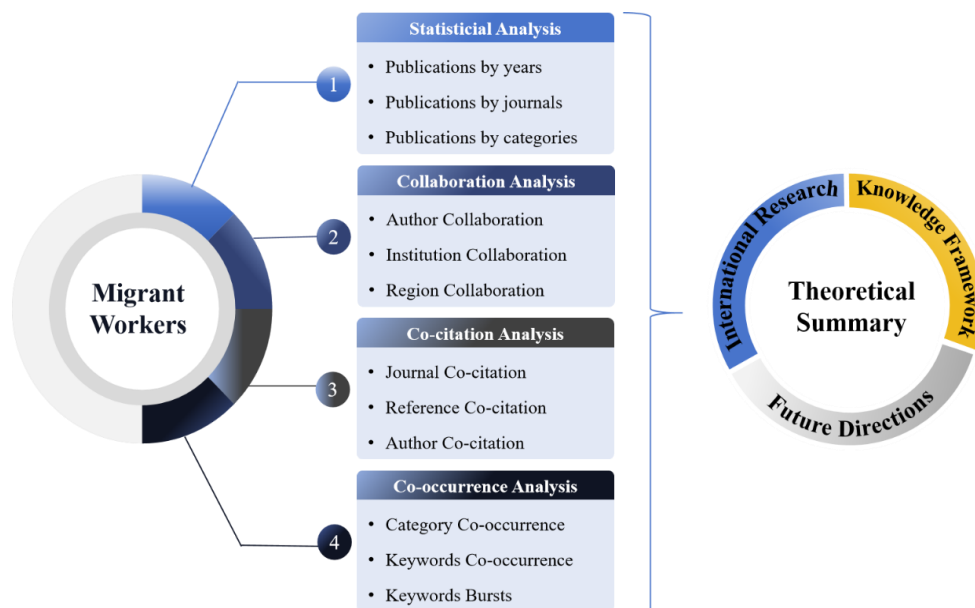


Figure A2. Research steps

Table A1. Number of publications by journals

Ranking	Journals	Count	Percentage	5-year IF*
1	Intl. J. of Environmental Research & Public Health	86	4.759%	4.8
2	International Migration	39	2.158%	2.1
3	PLoS One	39	2.158%	3.3
4	Journal of Ethnic and Migration Studies	37	2.048%	4.2
5	BMC Public Health	35	1.937%	3.9
6	Asian and Pacific Migration Journal	25	1.384%	1.5
7	Journal of Immigrant and Minority Health	23	1.273%	2.2
8	Sustainability	23	1.273%	3.6
9	Work Employment and Society	22	1.217%	4.8
10	Ethnic and Racial Studies	16	0.885%	2.9

*5-year IF: the latest indexed five-year journal impact factor of the journal

Table A2. Number of publications by categories

Ranking	Categories	Count	Percentage
1	Public Environmental Occupational Health	415	22.996%
2	Sociology	147	8.135%
3	Demography	145	8.024%
4	Environmental Sciences	122	6.752%
5	Economics	101	5.589%
6	Labor Industrial Relations	100	5.534%
7	Geography	93	5.147%
8	Interdisciplinary Social Sciences	84	4.649%
9	Area Studies	75	4.151%
10	Environmental Studies	71	3.929%

Table A3. Author collaboration

Ranking	Authors	Count	Centrality	Year
1	Hall, Brian J (Hall BJ)	11	0	2019
2	Lee, Hyeonkyeong (Lee H)	9	0	2012
3	Goldenberg, Shira M (Goldenberg SM)	9	0	2016
4	Cai, Yong (Cai Y)	8	0	2009
5	Li, Dan (Li D)	6	0	2020
6	Garabiles, Melissa R (Garabiles MR)	6	0	2019
7	Chen, Hui (Chen H)	6	0	2021
8	Babis, Deby (Babis D)	6	0	2018
9	Ayalon, Liat (Ayalon L)	6	0	2013
10	Zain, Siti Nursheena Mohd (Zain SNM)	5	0	2017
11	Yeoh, Brenda S A (Yeoh BSA)	5	0	2012
12	Suphanchaimat, Rapeepong (Suphanchaimat R)	5	0	2020
13	Sahimin, Norhidayu (Sahimin N)	5	0	2017
14	Brouwer, Kimberly C (Brouwer KC)	5	0	2016

Table A4. *Institution collaboration*

Ranking	Institution	Region	Count	Centrality	Year
1	University of London	UK	72	0.19	2003
2	N8 Research Partnership	UK	50	0.08	2006
3	Chinese University of Hong Kong	China	45	0.11	2009
4	National Univ. of Singapore	Singapore	43	0.06	2005
5	Sun Yat-Sen University	China	41	0.11	2006
6	Univ. of California System	USA	36	0.12	2002
7	Johns Hopkins University	USA	27	0.03	2002
8	Zhejiang University	China	24	0.06	2006
9	Fudan University	China	23	0.06	2011
10	University of Hong Kong	China	21	0.04	2007

Table A5. *Regional collaboration*

Ranking	Count	Centrality	Year	Region
1	552	0.17	2001	Peoples R China
2	373	0.48	2000	USA
3	231	0.31	2001	England, UK
4	166	0.23	Indicates that: 2001	Australia
5	111	0.09		Canada
6	80	0.06	2002	Thailand
7	71	0.07	2000	Singapore
8	58	0.01	2003	South Korea
9	52	0.03	2003	Italy
10	45	0	2000	Israel

Table A6. *Journal co-citation*

Ranking	Co-cited journals	Count	Centrality	Year	5-year IF
1	Journal of Ethnic and Migration Studies	337	0.02	2007	4.2
2	International Migration Review	316	0.11	2000	3.6
3	Social Science & Medicine	313	0.04	2002	5.2
4	Lancet	265	0.05	2002	106.9
5	BMC Public Health	265	0.02	2009	3.9
6	PLoS One	265	0.02	2012	3.3
7	International Migration	242	0.03	2007	2.1
8	Intl. J. of Environmental Research & Public Health	193	0.01	2015	4.8
9	Work Employment and Society	190	0.04	2007	4.8
10	American Journal of Public Health	178	0.22	2000	10.1

Table A7. *Reference co-citation*

Ranking	Co-cited references	Count	Centrality	Year
1	Moyce, 2018, Annu Rev Publ Health, V39, P351	31	0.03	2018
2	Hargreaves, 2019, Lancet Glob Health, V7, PE872	24	0.01	2019
3	Zhong, 2018, Epidemiol Psych Sci, V27, P256	16	0.05	2018
4	Liem, 2020, Lancet Psychiat, V7, PE20	16	0	2020
5	Hall, 2019, Psychiat Res, V271, P200	15	0.02	2019
6	Anjara, 2017, BMC Womens Health, V17, P0	14	0.03	2017
7	Ang, 2017, BMJ Glob Health, V2, P0	14	0.07	2017
8	Sterud, 2018, BMC Public Health, V18, P0	14	0.02	2018
9	Alberti, 2014, Work Employ Soc, V28, P865	13	0.25	2014
10	Zhong, 2015, J Affect Disorders, V183, P1	13	0.06	2015

Table A8. *Author co-citation*

Ranking	Co-cited authors	Count	Centrality	Year
1	Anderson B	134	0.17	2007
2	Wong DFK	101	0.07	2008
3	Chan KW	100	0.07	2007
4	World Health Organization	94	0.02	2015
5	National Bureau of Statistics of China	77	0.02	2012
6	Yeoh BSA	72	0.06	2003
7	Who	62	0.01	2014
8	Fan CC	53	0.09	2010
9	Ilo	51	0.02	2014
10	Ruhs M	51	0.02	2008

Table A9. *Category co-occurrence*

Ranking	Category	Count	Centrality	Year
1	Public, environmental & occupational health	415	0.58	2001
2	Sociology	147	0.19	2000
3	Demography	145	0	2000
4	Environmental sciences	122	0.03	2005
5	Economics	101	0.14	2001
6	Industrial relations & labor	100	0.02	2005
7	Geography	93	0.11	2001
8	Social sciences, interdisciplinary	84	0.22	2006
9	Area studies	75	0.03	2000
10	Ethnic studies	71	0.02	2009

Table A10. *Keywords co-occurrence*

Ranking	Keyword	Count	Centrality	Year
1	Migrant worker	469	0.06	2005
2	Migration	403	0.01	2004
3	Health	264	0.06	2001
4	Labor	137	0.01	2002
5	Immigrants	93	0.11	2003
6	Women	92	0.1	2000
7	Prevalence	87	0.11	2000
8	Gender	71	0.16	2004
9	Politics	69	0	2010
10	Employment	67	0.02	2003