

WORK-LIFE BALANCE AMONG MALAYSIAN FEMALE ENGINEERS: BIBLIOMETRIC REVIEW

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Abstract. This study uses bibliometric analysis to provide a detailed overview of research on the work-life balance of female engineers in Malaysia. By examining data from the Scopus database, 3718 relevant documents were identified using keywords related to work-life balance, Malaysia, engineers, and women. The analysis includes various aspects such as the number of sources published over time, the most cited countries, documents by country or territory, frequent keywords, and subject areas. The study offers a thematic overview of the challenges and trends related to the work-life balance of Malaysian female engineers. It also highlights emerging trends in the literature, such as the growing attention to the psychological impact of work-life balance and the role of flexible work arrangements. However, significant gaps remain, particularly in understanding the unique challenges faced by female engineers in Malaysia, indicating a need for more targeted research. The findings reveal that while female engineers play a crucial role in Malaysia, there is insufficient focus on helping them balance their professional and personal lives. This study contributes significantly to understanding this issue and suggests the need for further research in this area.

Keywords: *work-life, balance, Malaysian female engineers, bibliometric analysis*

Introduction

As society evolves, the traditional notion of men being the primary breadwinners is changing. Studies post-2020 indicates that women work for various reasons, including managing family duties, building careers, and supporting their families financially (Rincón and Martínez, 2020). Women's decisions to work are influenced by personal choice, trust in the government, and social connections. Despite the increasing number of women entering professional fields, significant challenges persist, particularly in engineering, where women represent less than 25% of the workforce. This highlights the need to address work-life balance issues specific to female engineers (Wilson and VanAntwerp, 2021). As society evolves, the traditional notion of men being the primary breadwinners is changing. Studies post-2020 indicate that women work for various reasons, including managing family duties, building careers, and supporting their families financially (Rincón and Martínez, 2020). Women's decisions to work are influenced by personal choice, trust in the government, and social connections. Despite the increasing number of women entering professional fields, significant challenges persist, particularly in engineering, where women represent less than 25% of the workforce. This highlights the need to address work-life balance issues specific to female engineers (Wilson and VanAntwerp, 2021).

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of women entering professional fields, significant challenges persist, particularly in engineering, where women represent less than 25% of the workforce. This highlights the need to address work-life balance issues specific to female engineers (Wilson and VanAntwerp, 2021).

Literature review

In cities like Copenhagen, Denmark, work-life balance means living a good and sustainable life. Efficient public transport and green spaces make people happy with work and personal life (Doost Mohammadian and Rezaie, 2020). In Helsinki, Finland, many companies help with work-life balance by offering flexible work hours and letting over 50% of employees work from home. They also support caregiving and give generous recovery time after childbirth (Yerkes et al., 2022). In Stockholm, Sweden, a strong economy and high living standards create a balanced work-life culture. Over 40% of employees work remotely, and generous parental leave policies exist. Norway, like Sweden, offers flexible work options and personal time (Joecks et al., 2021). In Auckland, New Zealand, shorter workweeks and ample leave create a pleasant work environment and low turnover. Gothenburg, Sweden, also benefits from generous leave and flexibility, resulting in high job satisfaction (Haar and Brougham, 2022). In Iceland, healthy living is promoted, while Austria supports healthcare and education to reduce stress and improve work-life balance (Hjálmsdóttir and Rafnsdóttir, 2024).

Western and Eastern cultures see work and life differently. As a multicultural and religious nation, Malaysia has unique values regarding work and life, meaning that ideas from other cultures might not fully apply (Haron et al., 2020). The World Happiness Index measures GDP, life expectancy, generosity, social support, freedom, and corruption. Despite COVID-19 challenges, Malaysians have felt happier, possibly because lockdowns reduced work-related stress and improved their work-life balance. However, Malaysia faces significant work-related issues (Ferrer-i-Carbonell and Ramos, 2021). Malaysian labor laws allow up to 45 working hours per week, much higher than the global average of 25.6 hours. With a population of 32.6 million and an almost equal gender distribution, more than half of Malaysians struggle to balance work and personal life, finding it hard to manage time with family or personal activities (Zainal Badri and Wan Mohd Yunus, 2022). Research shows that 20% of Malaysians feel stressed about balancing work and life, often seeing it as a conflict (Subramaniam et al., 2020). Therefore, balancing work and life is important for professors.

Professional women in Malaysia face unique challenges regarding work-life balance. The main issues include a work culture that values long working hours and prioritizes work over family, leading to burnout and reduced personal time. Future research could explore the effects of different organizational cultures on work-life balance and develop strategies to improve work-life balance policies (Rosman et al., 2020). This could include looking at the role of management support and the impact of flexible working arrangements on improving the mental health and productivity of professional women in Malaysia (Rosman et al., 2020). The Malaysian government encourages women to participate in the workforce and aims for about thirty percent of women in high positions. Currently, around forty percent of senior managers in Malaysia are women. Organizations will likely offer women more opportunities for higher positions as the working environment becomes more diverse and inclusive. The government also strives to reduce gender discrimination and protect women's rights in the labor market (Hassan,

2020). Additionally, it encourages married women who have left their professional careers for family reasons to return to work (Omar et al., 2020).

In summary, while some countries have successfully implemented policies that promote work-life balance, Malaysia still faces significant challenges. Addressing these issues requires a better understanding of Malaysian professionals' unique cultural values and work-life balance needs, especially women (Le et al., 2020).

Materials and Methods

We searched the Scopus database for articles using keywords related to work-life balance, Malaysia, engineers, and women. Our search yielded 3,718 results on June 24, 2024, which we refined to focus on relevant studies published between 2019 and 2024. Following our research process (*Figure 1*), we limited the document type to exclude reviews, removing 849 articles, leaving us with 2869 articles. Then, we limited the language to English, excluding 232 articles. So, we assessed 2637 articles for eligibility. We focused on research from 2019 to 2024, excluding 794 articles, leaving 965 articles for analysis. We further excluded research that did not focus on work-life balance in Malaysia, resulting in 878 documents for our bibliometric analysis. We used OpenRefine to clean the data. We then performed bibliometric analysis using Biblioshiny. Biblioshiny created word clouds to analyze sources' production over time, the most cited countries, and the most frequent words. We also analyzed the data directly from the Scopus website. Microsoft Excel was used for computations and detailed analysis in tables.

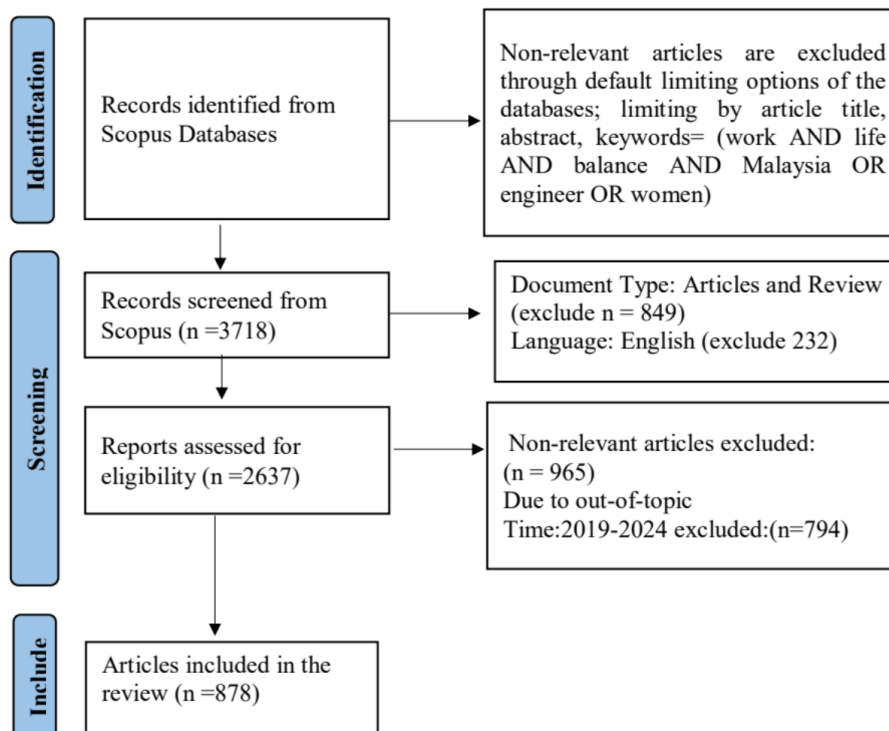


Figure 1. PRISMA flow diagram.

Results and Discussion

Documents profile

Table 1 illustrates 876 journal articles and 2 review articles within the field of work-life balance in Malaysia. Journal articles constitute 99.77% of the document type.

Table 1. Document type.

Document type	Total publication	Ratio (%)
Journal article	876	99.77
Review article	2	0.23
Total	878	100

Source production over time

Figure 2 shows the trends in scientific publications about work-life balance. It illustrates the production from different sources over the period from 2019 to 2024. Figure 2 shows a noticeable increase in the number of publications on work-life balance since 2019, with a significant rise in most sources starting from 2020. The International Journal of Environmental Research and Public Health experienced the largest increase in such publications, followed by PLOS One. This growth indicates a heightened interest and surge in research activity in the field of work-life balance. However, despite this overall increase, there remains a notable gap in research specifically focusing on female engineers in Malaysia (Le et al., 2020). This gap highlights the need for more targeted studies in this area. Furthermore, our analysis suggests that policy interventions, such as improving flexible working arrangements, could better support these professionals in achieving a work-life balance (Omar et al., 2020).

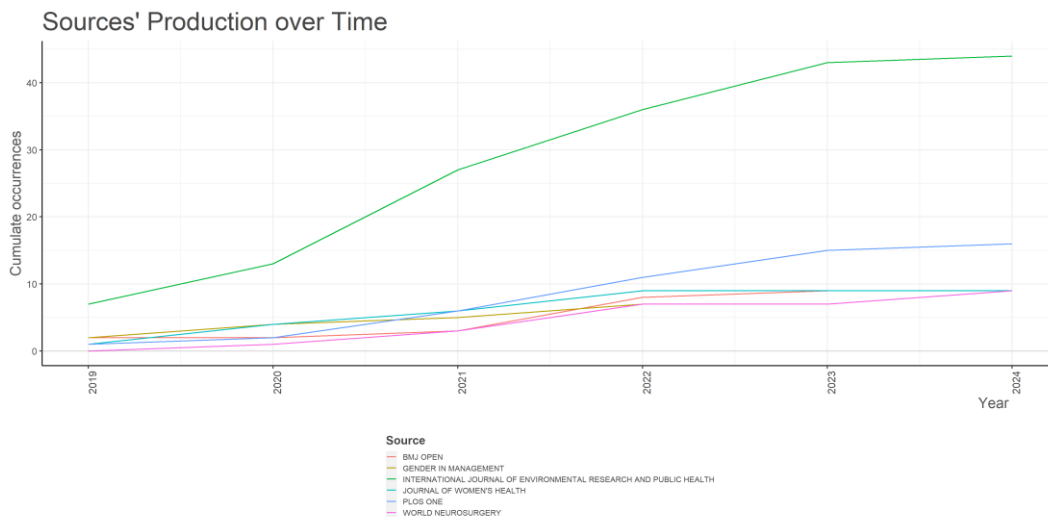


Figure 2. Sources' Production over Time.

Most cited countries

Figure 3 shows the most cited countries in work-life balance research from 2019 to 2024-the figure highlights which countries have been most influential in this field. To focus on work-life balance studies, you can look at research from these highly cited countries. The Figure 3 shows that the USA leads with the most citations at 3,428, followed by the United Kingdom with 735, and Canada with 684. These results indicate

that the most cited countries are predominantly Western, with limited citations from developing countries like Malaysia. Future studies should focus more on Malaysia to address this disparity.

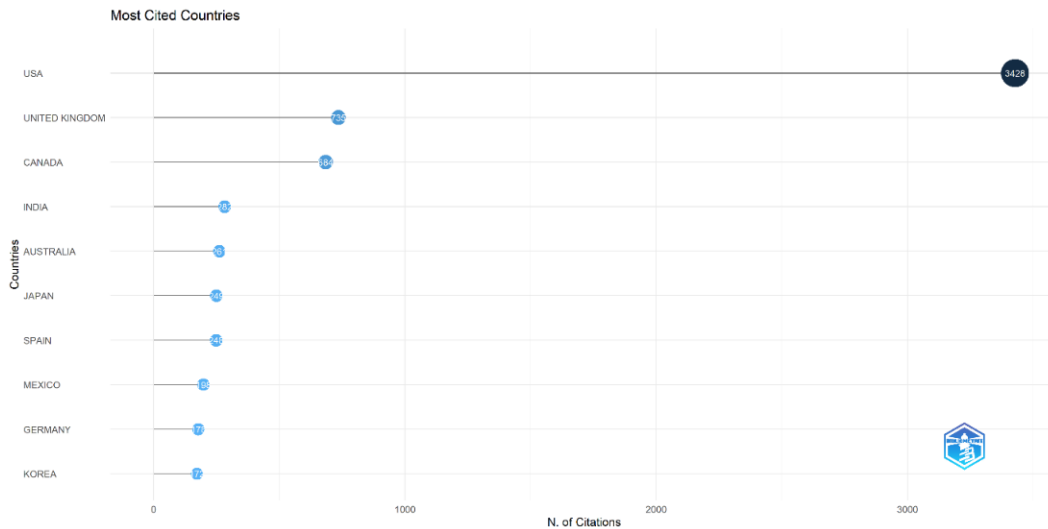


Figure 3. Most cited countries.

Documents by country or territory

This study used data from the Scopus website to understand the most cited and researched countries on work-life balance. *Figure 4* shows the number of documents by country or territory in work-life balance research from 2019 to 2024, comparing up to 15 countries/territories from 3,718 Scopus documents. The figure highlights the most influential countries in this field and includes information about Malaysia's contributions. *Figure 4* shows that the United States has the most documents, with over 1,000. The United Kingdom follows with more than 400 documents, and Australia has just under 400, slightly more than Canada. Germany and Sweden each have around 200 documents. However, there is limited research on Malaysia. This analysis suggests that most research comes from Western countries, leaving a significant gap in studies focused on Malaysia. To address this gap, future research should prioritize exploring work-life balance in Malaysia, particularly focusing on specific professions or cultural contexts that are underrepresented in current studies (Haron et al., 2020).

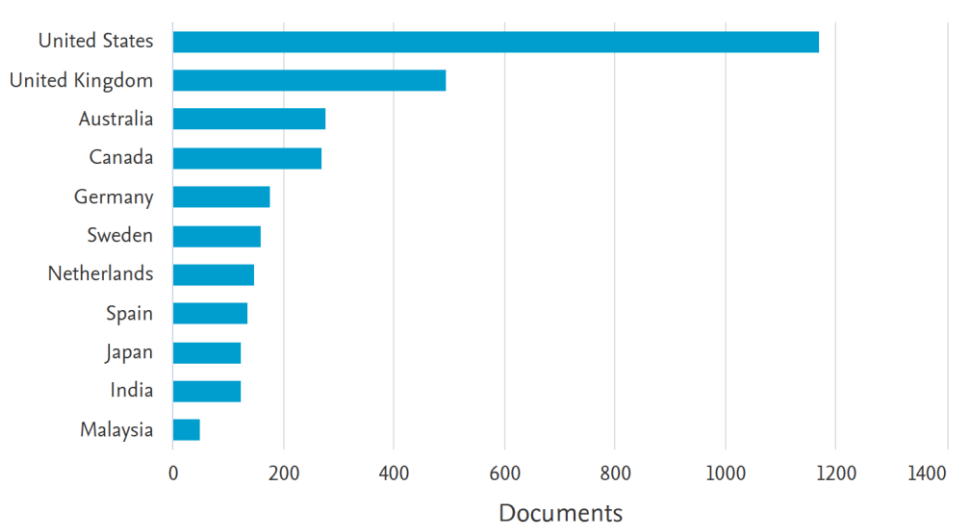


Figure 4. Documents by country or territory.

Most frequent words

Figure 5 shows the most frequent words in work-life balance research from 2019 to 2024. This data analysis helps us understand these studies' key themes and topics. Figure 5 shows that the word "female" appears most frequently, with 980 occurrences, followed by "male" with 600 occurrences. "Work-life balance" is mentioned 594 times, and "adult" appears 539 times. This data indicates that researchers are more focused on studying females' work-life balance than that of males. It suggests that work-life balance might be a more significant issue for females in managing both their professional and personal lives. However, this focus on females highlights a gap in research on males' work-life balance. Future studies should explore this area further to understand the challenges and needs of males in balancing their work and personal lives. Additionally, research could also investigate how work-life balance impacts different age groups and cultural contexts.

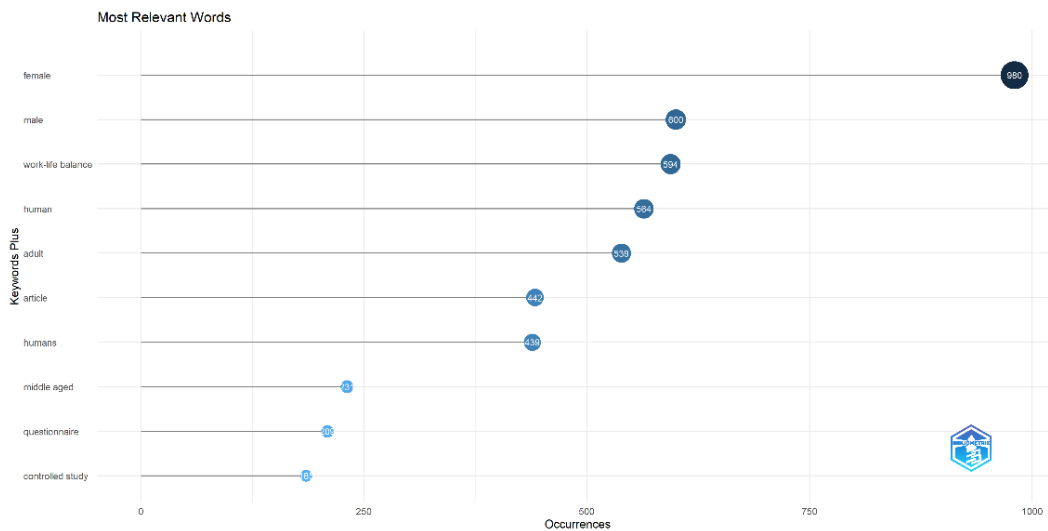


Figure 5. Most frequent words.

Documents by subject area

This study used data from the Scopus website to identify which subject areas of work-life balance have the most and least research. *Figure 6* shows the number of documents by subject area, highlighting where work-life balance research is most and least concentrated. *Figure 6* shows that the subject area with the most work-life balance research is social science, making up 25.4% of the total. Medicine follows with 19.7%, business and management with 14%, and other fields with 11.7%. However, engineering only accounts for 5.2%. This indicates that there is very little research on the work-life balance of engineers. This gap highlights the need for more research focused on engineers, particularly in understanding their unique work-life balance challenges. Future studies should explore this area to provide insights that could lead to better support systems and policies for engineers in balancing their professional and personal lives (Omar et al., 2020).

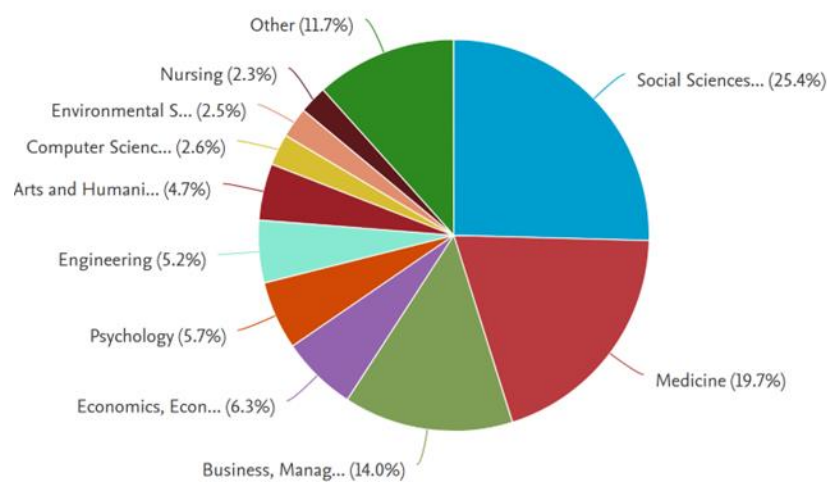


Figure 6. Documents by subject area.

This study analyzed articles on work-life balance published between 2019 and 2024, using data from Scopus. The main findings show important trends and suggest future research directions for understanding work-life balance among female engineers in Malaysia. *Figure 1* shows that the number of publications on work-life balance has increased since 2019, indicating that this topic is becoming more popular. *Figures 2* and *Figure 3* reveal that the most cited research comes from Western countries, especially the USA and the UK. However, very few cited studies from Malaysia suggest that most research is based on Western perspectives, which might not suit Malaysia. *Figure 4* shows that the most related words of work-life balance are female; it seems that many people are concerned about the work-life balance of gender studies and females. Also, it can predict that female professional women face more challenges in balancing work and personal lives. *Figure 5* shows that most work-life balance research is in social science and medicine, with very little research on engineers. The data reveals a growing interest in work-life balance research, especially in social sciences and medicine. However, there is limited research on the work-life balance of engineers and few contributions from developing countries, including Malaysia (Hamdan et al., 2024). Future research should address these gaps by focusing on different professions and regions to better understand female engineers' work-life balance experiences in Malaysia (Lazim et al., 2023). Considering their cultural, social, and economic situations, understanding the

work-life balance of female engineers in Malaysia is important. Using ideas from different fields, like gender studies, can help create better strategies to solve work-life balance issues. This approach can lead to new solutions that meet the specific needs of female engineers in Malaysia.

Conclusion

This study used bibliometric analysis to examine research on the work-life balance of female engineers in Malaysia, using data from the Scopus database. The findings show a growing interest in work-life balance research, especially in social sciences and medicine, but highlight a lack of research on engineers and limited contributions from developing countries, including Malaysia. The study found that most of the influential research comes from Western countries, suggesting that current work-life balance practices might not fully apply to Malaysia. More research is needed to focus on the specific cultural, social, and economic contexts of female engineers in Malaysia. Future research should address these gaps by focusing on various professions and geographic regions better to understand the work-life balance among women's experiences. Incorporating insights from fields like gender studies can help develop effective strategies to address work-life balance issues, leading to solutions tailored to the needs of female engineers in Malaysia. Based on the findings, several policy recommendations can be made to improve work-life balance for female engineers in Malaysia. These include: Implementing flexible work arrangements to accommodate personal responsibilities. Providing career development programs tailored to women in engineering and Encouraging organizations to adopt family-friendly policies that reduce the burden on working mothers (Rosman et al., 2020).

Acknowledgement

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

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