

Analysis of the Menotech and Femtech markets for menopausal women in Japan

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In recent years, Japan has faced significant challenges in declining labour force participation due to falling birth rates, an aging population, and depopulation in rural areas. It is recognized how important it is to support menopausal women in terms of the economy and the gender gap. Here, we identify the status and trends of the Japanese Femtech market to support the health and activities of menopausal women in Japan. We analyse the situation in the domestic and international Menotech markets is analysed to understand the positioning of domestic and foreign companies in the Menotech market. Moreover, through the comparison with foreign Menotech companies, we could examine the current state of the Japanese Menotech market in comparison and study the direction of Menotech business development in Japan. After analysing Menotech companies in Japan and abroad through literature and data analysis, we claim that the Menotech market is in its infancy yet is expected to be one of the areas with the potential for dramatic market expansion. Among these areas, digital services are under developing in the Japanese Menotech market. Thus, we suggest that more creation of new products and services, knowledge dissemination, and the use of Menotech communities and associations are keys to promoting expansion of the potential Japanese Menotech market and the spread of Menotech services.

Keywords: *menopause; Femtech; design; services*

1 Introduction

The proportion of women in each generation in the Japanese population increases with age, with 60% of women aged 65 and over and 70% of those aged 85 or over. The unique living environment issues of this age group overlap with the effects of aging on physical functions. They are associated not only with physical situations but also with mental and psychological symptoms and disorders. The way female spends and overcome menopause also affects the quality of life in the aging future.

Relatedly, Menopausal symptoms are influenced by both environmental and temperament factors (Owada et al., 2012). In East Asia, where Confucian culture and patriarchal family traditions remain



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prevalent, women often perceive menopause as a loss of youth and beauty, leading to a lack of awareness about menopause care and increased anxiety. A recent survey by the Ministry of Health, Labour and Welfare (Ministry of Health, Labour Standards, 2021) revealed a strong demand for menopausal disorder treatments among users of online medical services. Due to the ongoing Covid-19 pandemic, there is a growing need for digital tools and online medical care to address this demand.

In Japan, the promotion of women's activities is also influenced as part of the reform of work styles. These activities encourage companies to develop products for women's health, which will drive growth in the menopause care market.

2 Purpose of this study

This study aims to support the health and activities of menopausal women in Japan by achieving the following objectives:

- Identify the size and business sector of Femtech companies in Japan to understand the market conditions and trends for Femtech.
- Analyse data to visualize the status of Menotech companies that have gained attention domestically and internationally and to understand the positioning of each company in the Menotech market.
- Compare the current status of the Japanese Menotech market with foreign Menotech companies and explore future directions for Menotech's business development.

3 Definitions of Femtech, Menopause Care and Menotech

The term "Femtech" was coined from the words "Female" and "Technology". It refers to products and services that use technology to solve women's health issues. The term is defined as an abbreviation of "female technology."

Menopause Care is a term that combines the words menopause and care. It refers to maintaining or improving one's health and well-being during menopause. The Japan Maternity Health Association defines Menopause Care as a program to help people cope with menopausal symptoms and live a healthy life. In 2022, the term Menotech was coined to refer specifically to products and services that use technology to address the physical health problems women experience during menopause, typically between the ages of 45 and 55.

4 Previous and related studies

4.1 Previous studies

According to Shima (Shima, 2007), it is essential to devise a counselling location suitable for women's work style and environment to balance work and family roles. Similarly, Ikeda (Ikeda, 2010) concluded that providing the correct information about the physical and mental characteristics of menopause is essential during the premenopausal period. Based on their studies, it is recommended that women start participating in health classes and health education programs that are practical, acceptable, and age-appropriate (Yoshizawa et al., 2000).

4.2 Research in other fields

From the standpoint of the humanities, social sciences, and gender studies, disparities affecting women can be observed in many areas. These encompass areas such as childcare support, improving the working environment for women, and support in old age. Notably, one area that still lacks adequate attention is the study of menopause (Nagase, 2022).

In the field of gender studies, it becomes evident that services and products in the Femtech market are developing more rapidly than in the research and academic fields. The provision of quality services related to health counselling and health information is of particular interest. In addition, research data and evidence on effective interventions for menopausal symptoms and supporting evidence are still awaited (Hayashi, 2022).

As the references show, women's health and lifestyle issues are of considerable importance from a gender perspective. Nonetheless, there is a lack of research and evidence on menopause. To address this gap, a more comprehensive and effective approach is needed, leveraging the advancements in Femtech and gender analysis. Improving emotional value and customer experience are key factors in developing services and products for women.

4.3 Other related studies

4.3.1 A Survey analysis of attitudes toward menopause care

An online survey was conducted between July and October 2020 among women living in Tokyo, Japan, and Qingdao, China. The age range of participants was 45-60 years (including those who were not receiving medical care at the time of the survey). The total number of participants was 60, with 30 participants from each location. The online questionnaire used a combination of single-choice questions for single answers, multiple-choice questions for multiple answers, and free-text responses (Liu, Sato, 2021). This survey found that during menopause, those respondents who want to do things but find it challenging to do so tend to have increased anxiety and negative feelings as they cannot control their emotions and physical condition. In other words, respondents indicated an overall high level of negativity toward menopause, indicating that many women have a sense that they are aging, with their feminine characteristics disappearing. Only a few responses positively evaluated menopause as a transitional phase in their lives.

In addition, we discussed anti-aging. In this context, the respondents wanted more time on health maintenance/improvement and personal hobbies. In terms of their exercise habits, respondents showed an increasing interest in a variety of physical activities.

4.3.2 Interview survey on the social implementation of Femtech and Menopause Care

From May to July 2021, stakeholders in the health tech industry were interviewed using semi-structured interview techniques. Text files were created from the obtained interviews and analysed using text mining.

Regarding awareness of Femtech in Japan, respondents noted that the media highly recognize the term Femtech and what is most often used by majoring them is the physiological Femtech service.

Respondents noted that the media highly recognizes the term Femtech and that the most often used service is physiological Femtech. However, Femtech services and products need to penetrate the

market, and women's awareness of their rights needs to be awakened for new business development of more multi-dimensional and customized services designed for menopausal women to be in demand.

Considering Menopause Care and Femtech from the user's point of view, it was found that society needs to understand women's physiological issues and connect them to social problems that lead to women leaving the workforce or being passed over for promotion. In addition, it is necessary to connect Femtech with national systems and systematically support services, products, and procedures.

The aforementioned survey revealed that women are compelled to make changes in their lives due to life events. As a result, the importance of Femtech and services for these women has been in evidence. Based on these findings, it becomes crucial to understand the importance of Femtech innovation and to conduct research to comprehend the market situation and potential for designing services that effectively address the needs and challenges of menopausal women.

5 Methods

In this study, we conducted research on the Femtech and Menotech markets using two methods: a literature review and data analysis.

To gain insights into the Femtech market, we collected company information on Japanese Femtech companies from the Internet. The information collected included the companies' business descriptions, sizes, and histories, among other relevant data. These details were compiled to provide an overview of the Femtech market.

We, then, analysed the data on Femtech companies using a technique called Quantitative Dish Analysis. Through this analysis, a scatterplot was created based on the data collected, with the score values for each company plotted on the x-axis as the horizontal axis and the y-axis as the vertical axis. In addition, cluster analysis was performed, and clusters were added to the scatterplot to visualize the similarities and relationships between the companies. Hierarchical cluster analysis helped us group firms based on information about the firms in the Femtech market.

In parallel, we conducted extensive research on articles and reports available online to gather detailed information about national and international Femtech companies. This allowed us to compile a dataset on their business activities, company size, and history. As for Menotech companies, we analysed the data using the category scores obtained from the Quantified Plate Analysis, resulting in a scatter plot of the score values for each category. By examining these scatter plots, we gained valuable insights into the business development areas and interrelationships of Menotech companies.

Finally, we compared Japanese and foreign Menotech companies and discussed the characteristics and challenges of the Japanese Menotech market. Based on this analysis, we assessed the status and potential of Menotech's business development in Japan.

6 Survey on the current status and issues of Femtech in Japan

6.1 The Japanese Femtech market

According to a study by Yano Research Institute Ltd. (Yano Research Institute, 2021), the size of the Femtech market in Japan recorded approximately 59.7 billion yen in 2020 (103.9% of the previous year) and increased to 63.6 billion yen in 2021 (106.4% of the previous year).

Just as Femtech is projected to grow worldwide, the economic impact of Femtech in Japan is expected to approach approximately 2 trillion yen by 2025. According to the Ministry of Economy, trade and Industry's study of the impact on the economy (Hitachi Consulting, 2021), the estimated economic impact of Femtech on women's activities is approximately 240 billion yen/year in the menstrual field, 300 to 500 billion yen/year in the pregnancy and infertility field, and 1.3 trillion yen/year in the menopause field. In the menopause field, the annual sales are approximately 1.3 trillion yen/year. By product/service type, Femtech products and services currently in widespread use are categorized into menstruation, pregnancy/infertility, postpartum care, menopause, gynaecological diseases, and sexual wellness.

In particular, a variety of products and services are expanding in the Japan Femtech market, including menstrual apps, absorbent panties, testing services, services for infertility treatment, D2C brands for women's healthcare, and web media.

Below is a summary of the areas of focus included in Femtech.

- **Telemedicine and medical diagnosis**
The spread of covid-19 has increased the importance of online medical services, and medical services for pregnant and parenting women are expanding (CB Insights, 2021).
- **Infertility treatment related**
Various services have been launched to meet the needs of a wide range of users, with an increasing number of the one-child family for early users and gynaecology for early users (CB Insights, 2021).
- **Women's Health Support**
Large companies are entering the market with health support projects for women's health. A program is also validated to support gynaecological consultations and low-dose pill use through online medical care (DAIWA HOUSE INDUSTRY CO., LTD, 2023).
- **Femtech x Insurance Services**
Major insurance companies are highly interested in the Femtech area. New insurance products for women are being developed in conjunction with Femtech Product Services (Kimura, 2021).
- **Content for young people**
Content for young people is an area that has grown dramatically since 2022. Though this is not precisely Femtech, when talking about Femtech, the low health literacy of women in Japan is often mentioned as an issue (Beauty Biz Media, 2021).

Regarding Femtech trends in Japan, solutions related to fertility treatment, menstruation, online medical care, and postpartum childcare have been enhanced (Femtech Support Services Demonstration Project Grant Program Office, 2021). According to a study by Fermata in December 2020 (Hellofermata,

2020), the number of Femtech services in Japan has increased from 51 to 97 by December 2020. However, there are still limited solutions that address symptom improvement in menopausal care. According to a 2020 survey by Cheryl Lampkin of AARP Research (Lampkin, 2020), 80% of all women and 93% of women aware of menopause would be interested in a technology approach to menopause. However, there are no standout solutions. For this reason, EloCare co-founder and CEO Mabel pointed out that the biggest problem is the lack of awareness about menopause (Takahashi, 2022).

6.2 Analysis of the overall Femtech market positioning map

This chapter covers 69 Femtech companies in Japan whose products are mature enough, which means more than prototypes or fast services by the end of September 2022 (Table 1).

Table 1. Summary of Femtech Companies in Japan

1	2	3	4	5	6	7	8	9	10
ninpath	aMbellir	baycrews	Benesse	fermata	Mellia	PharmaX	AMY	OKA-MOTO INDUSTRIES	Oryza
11	12	13	14	15	16	17	18	19	20
Carter Technologies	Connehi to	PARA-MOUNT BED	baby-life-lab	mi-crosonic	Merry Do Beauty Products	Melody International	LAC Healthcare	laundry box	linkage
21	22	23	24	25	26	27	28	29	30
Asahi Kasei Pharma	Mugwor Thermal Therapy Association	cart	CURUC-URU	F Treatment	Be-A Japan	BLAST	encyclo	Entale	EXIA
31	32	33	34	35	36	37	38	39	40
G-Place	hanafu	HON-MONO	Kids Public	Lily MedTech	Linc'well	M and more	MEDITA/MEDITA inc.	OI method	TRULY
41	42	43	44	45	46	47	48	49	50
WRAY	Alba Corporation	Ateam Wellness	MTI	body notebook	genome clinic	Saint-Louis International	C-Connect	jocone	Jyosanshi GLOBAL Inc.
51	52	53	54	55	56	57	58	59	60
silky style	native	Hanamisui	fusion-works	Pro Labo Holdings	Health& Rights	poppins	mirai-colors	initial	LinkAge
61	62	63	64	65	66	67	68	69	

mira	Maru- beni Cor- poration	HARAD A COR- PORA- TION	Shinni- honsei- yaku	SAGAMI RUBBER INDUS- TRIES	TEIJIN LIMITED	Tomita Shoji	Ajuma	yuhido
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Table 2. List of Category Items

Enterprise scale			Corporate History			Gender of the President				
Large	Me- dium	Small	Large	Me- dium	Short	Male	Female	Un- known		
Business Division										
Service Devel- op- ment	Men- strual prod- ucts	Cloth- ing and gen- eral goods	Sup- ple- ments	Medi- cal sup- plies	Medi- cal equip- ment	Simple test kits	Cos- metics and beauty prod- ucts	Exami- nation	Sleep Sup- port	Warm- ing and blood flow care
User age range			Emphasis in design			functionality				
Young er	Middle Age	Senior Tier	Large	Me- dium	Small	Large	Me- dium	Small		

See Table 2 for specific category settings. By then, to classify each firm and category data (hypothesis), we analysed the data using quantification theory III and created scatter plots. Further cluster analysis was conducted and clustered elements were added to the scatter plots. The clusters obtained from Figure 1 are used, and the results are displayed in a scatterplot (Figure 2).

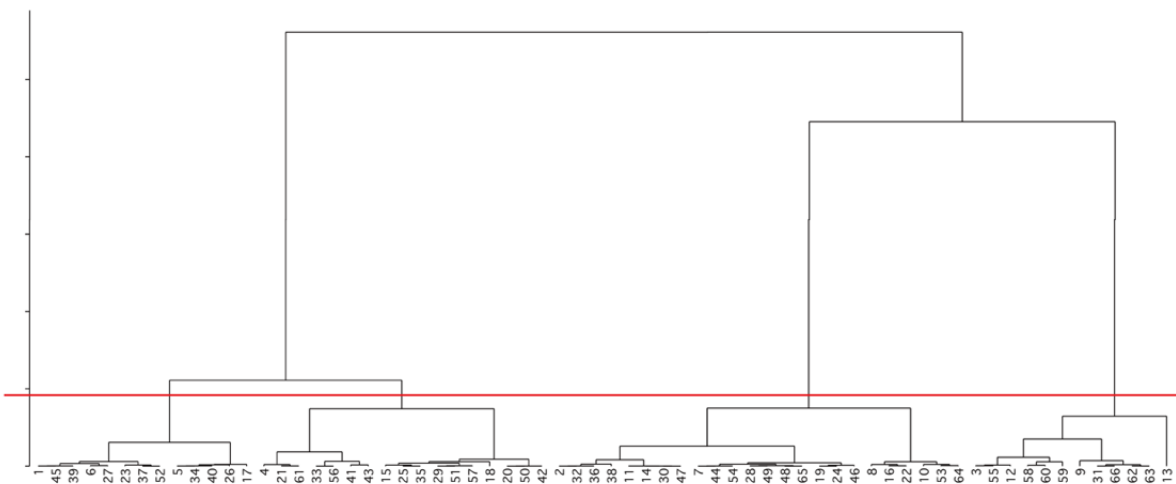


Figure 1. Results of cluster analysis (dendrogram).

Figure 2 is a positioning map confirming the current status of the Femtech market and the positioning of each company. The vertical axis refers to the "Business Division." Companies in the "Business Division - Medical" is at the top, and companies in the "Business Division - Everyday Life" are at the bottom. Along the horizontal axis, companies in the "Enterprise scale-Small" category are on the left, and companies in the "Enterprise scale-Large" category are on the right.

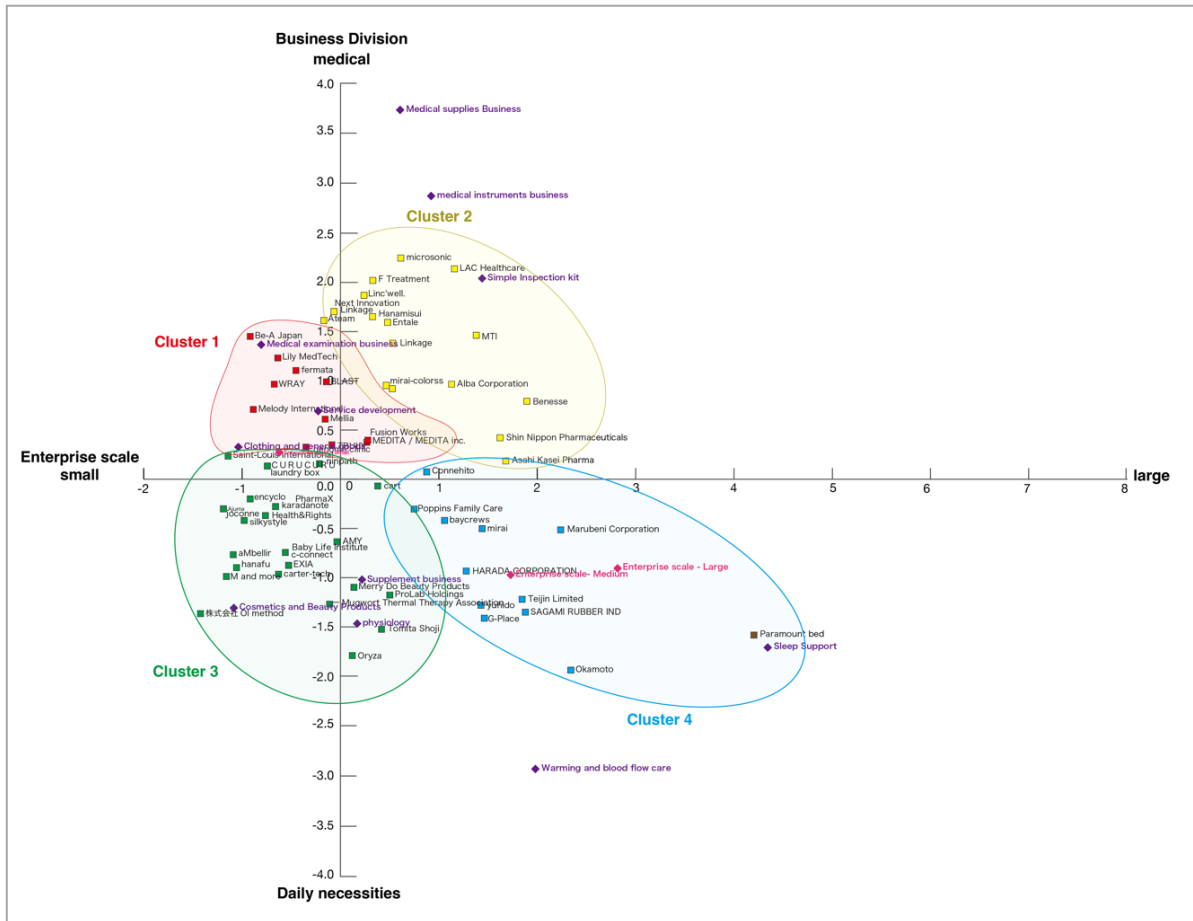


Figure 2. Results of Quantification Theory III and Cluster Analysis.

Looking at the overall picture, small Enterprise scale, beauty products, and daily necessities companies are clustered in the lower left area of the figure. The upper left area gathers companies of small size and in the Business Division of medical testing, apparel, and general merchandise. In the upper centre area, there are Femtech Japan service development companies. The upper right area presents companies with large sizes, medical-related pharmaceuticals, medical equipment, and simple test kits. The lower right area distributes large-scale companies in supplements, sanitary products, and other daily necessities.

Overall, many of these companies target young and middle-aged people, service development, cosmetics/beauty products, and sanitary products. In the case of female presidents, there are many connections to apparel and general merchandise. Large companies are also scattered in the figure's lower right area: "Paramount Bed Corporation" has a sleep support business.

Regarding the cluster analysis results (Figure 2), first, at the upper left position of the figure, Cluster 1 refers to small firms cluster related to medical and daily living businesses, characterized by small firm size. Their Business Division belongs to medical products and daily living products. Cluster 2, in the upper right area of the figure, is a cluster of medium and large companies in the Business Division of "medical devices," "test kits," and "service development. Cluster 3 is the largest cluster in terms of the number of firms involved small firms related to daily life business, such as "cosmetics and beauty products," "supplements," and "menstrual hygiene. Cluster 4 in the lower right area of the figure indicates large firms cluster related to daily living products. Many large firms characterize the size of

firms in Cluster 4. However, it is the cluster with the smallest number of firms. Their main Business divisions are physiology and supplements.

6.3 Considerations

The analysis results allow us to classify Japanese Femtech firms into four clusters and identify the characteristics and positioning of each, as shown in Section 6.2.

Small Business Cluster 1 and Small Business Cluster 3, both related to the medical and daily living sector, appeared to be made up of many of the same small businesses, clearly developing businesses ranging from medical testing to service development, apparel and sundries, and daily living products.

In addition, Cluster 2, representing the medium and large companies related to the medical sector, is mainly engaged in developing medical devices, test kits, and services. Cluster 4, characterized by large enterprises related to the daily life sector, is mainly engaged in the business development of physiological products and supplements.

Japan's Femtech market is a cluster of small companies, as in Clusters 1 and 3. Large and medium-sized firms have entered the medical field and some daily necessities fields. In other words, the Femtech market in Japan is in its early (budding) stage, and the number of large and medium-sized firms is insignificant. Overall, most companies are concentrated in the areas of daily necessities and service development, which suggests that the number of companies providing daily necessities and services, mainly venture companies, has a particular potential to increase.

7 Trends and analysis of Femtech markets outside of the country

7.1 Literature review of the Femtech market

The current status of the worldwide Femtech and Menotech markets is determined, and prior literature is collected based on information such as the nature of the company's business field, company size, company history, country/region (state), and design process put on the website regarding Femtech.

1. Perform a literature search on CiNii Article using the keywords 'Femtech,' 'Menotech,' and 'menopause'.
2. Using the same keywords, gather related materials (articles, reports, papers, etc.) through the search.

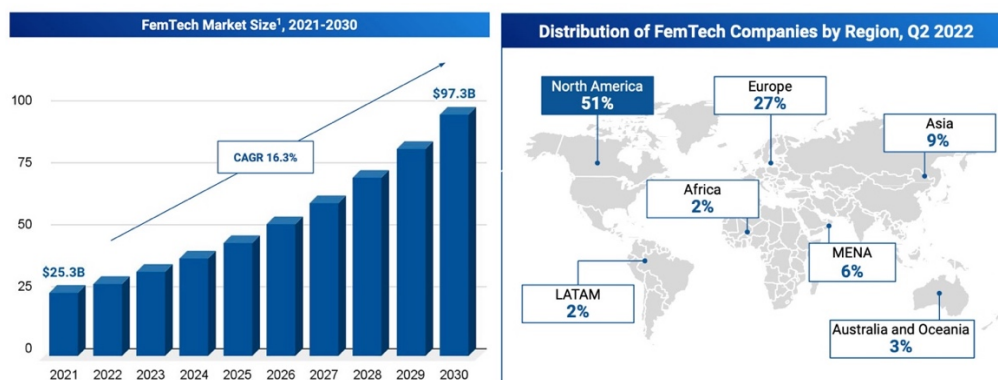


Figure 3. Femtech Market and Company Distribution by Region in 2022(Femtech Analytics, 2022).

According to the Femtech Industry Landscape Q2 2022 (Femtech Analytics, 2022) by Femtech Analytics (FTA) (Figure 6), the Femtech market was \$25.3 billion in 2021 and is estimated to grow at a CAGR of 15.6%. It is estimated to reach \$97.3 billion by 2030, growing at an annual growth rate of 15.6%.

According to an article from DIAMOND SIGNAL (Oshima, 2022) and forecasts by Coyote Ventures, a VC firm specializing in women's health and wellness, and Femtech Focus (FemTech Analytics, 2021) , a non-profit organization that distributes information and supports startups in the Femtech space, the global Femtech market according to forecasts by Coyote Ventures, a VC firm specializing in women's health and wellness, and Femtech Focus, a non-profit organization that distributes information and supports startups in the Femtech space, the global Femtech market is expected to grow to \$1.186 trillion by 2027.

Investment in the Femtech market has surged recently, with total funding reaching \$19.7 billion in December 2022 (+35% y/y). By region, North America accounts for more than 50% of the market, followed by Europe at 23.5% and Asia at 9%.

The number of mentions of "Femtech" in the global news regarding Global Players is increasing. There is a worldwide focus on women's healthcare and the products and services that help solve their challenges. Globally, 1,550 companies operate in the Femtech space, including existing players and large companies entering the market. In addition, there are 30 R&D centres specializing in women's healthcare and medical fields, and many investments are still undergoing. Anti-aging beauty, fertility, infertility treatment, pregnancy, and postpartum care. Various players are emerging in women's healthcare in general and sexual wellness.

According to an article by Nakagawa in PR TIMES MAGAZINE (Nakagawa, 2022), different products and services are being created and improved, with the birth of D2C companies for sexual wellness products and the development of non-invasive methods to diagnose endometriosis. In addition, while some products and services for the wealthy are approaching saturation globally, the need for products and services for low-income consumers is expected to grow.

Foreign Femtech companies tend to focus on creating device-based services and monitoring solutions that cover a wide range of needs. Foreign Femtech companies are also known for handling various topics and providing comprehensive solutions. As these companies collect more and more data, there is potential to discover new ways to use it that were not previously known.

7.2 Analysis of global Menotech companies

To understand the current status of the Menotech market within the Femtech sector, a literature review on Menotech was conducted.

According to an article from Axios (Reed, 2022) to the Society for Human Resource Management in the United States (Stump, 2023), about 27 million people, or almost 20% of the U.S. workforce, are experiencing menopause. About 27 million people, or nearly 20 percent of the U.S. workforce, have experienced menopause.

According to a Biote study (Biote, 2022), 40% of people experience menopausal symptoms that interfere with their weekly work performance and productivity; one out of five are considering quitting smoking to control symptoms. Bloomberg, citing consulting firm Frost & Sullivan Health Care and Life

Sciences, reported that worldwide, \$150 billions of productivity is lost annually related to menopause (Burden, 2021).

According to a new report by Grand View Research (Grand View Research, 2023), the global Menotech market is expected to reach \$24.4 billion by 2030 from \$15.4 billion in 2021.

The surge in the fertility, pregnancy, and menstrual care solutions and Menotech solution segments is also impacting the expansion of the Femtech market. Developing new services and solutions is gaining momentum in the Menotech market.

The global Menotech solutions industry is also transforming as the covid-19 pandemic and unmet healthcare needs for women are gaining attention.

Moreover, Menotech is the next opportunity to come along. Healthcare, health information technology (HIT), and pharmaceutical companies are looking to enter the Menotech market.

Menotech startups need to develop more innovative products and services to improve older women's symptoms.

As the Menotech market segment matures, it is also diversifying its offerings through mergers and acquisitions; more and more startups, including Carrot, are gaining attention in the Menotech market.

The current Menotech market has been previously untapped but is attracting further attention as more and more women enter menopause each year (a demographic known as silver tsunamis).

7.3 Survey analysis of Menotech companies

In our analysis of Menotech market data, we included 49 Menotech companies worldwide whose products are more than prototype development and not closed for service as of December 2022 (Table 3).

Table 3. Summary of Menotech companies in Japan and abroad

1	2	3	4	5	6	7	8	9	10
NeuEve	Elektra Health	Meno-pause Experts Group	Grace Cooling	Me-noLabs	State of Meno-pause	Stella	Tabu	Joylux	Khyria
11	12	13	14	15	16	17	18	19	20
La-dykind	Madorra	IdentifyHer	Vitabi-otics	Well-Femme	Wom-anness	Wom-aneze	Women of a Certain Stage	XbyX – Women in Balance	Adora Digital Health
21	22	23	24	25	26	27	28	29	30
Alva Health	No-bodyToldMe	Hot Girls Pearls	GenM	Happee Un Ltd	Health & Her	Herstasis Health	IAMEN O. Health	Meno Rebelle	MenoHealth
31	32	33	34	35	36	37	38	39	40

The Menopause Method	Upliv Health	Vira Health	Femfeel	Issviva	ELO-CARE	Embr Labs	Lisa Health	wile	Baushe
41	42	43	44	45	46	47	48		
become	caria	Gennev	TherapeuticsMD,	TRULY	yorisol	afactory	LiLuLa		

Table 4. List of Category Items

Enterprise scale			Corporate History							
Large	Small		Large	Medium	Short					
Business Division										
Service development	Menstrual products	Education	Clothing and general goods	Treatment	Supplement	Medical supplies	Medical equipment	Consultant/Organization	Cosmetics, beauty products	
Country/region (state)							Emphasis in design			
USA	United Kingdom	Japan	European countries other than UK	Asian countries other than Japan	Canada	Australia	Large	Medium	Small	

See Table 4 for specific category settings. In this context, the criteria for judging the importance of design are well explained in the design development process related to products on each company's website.

For a sample of 49 companies, attribute information such as Enterprise scale, company history, business sector, and country/state are compiled into a table, and using the Quantification Method III, the results are displayed in a scatter plot to examine the meaning of the axes.

Table 5. List of Category Score

Category Scores	Category	X	Y
1	Business Division-Service development	0.248	0.814
2	Business Division-Menstrual products	-0.668	-1.520
3	Business Division-Education	-0.997	-0.090
4	Business Division-Clothing and general goods	-1.060	-1.065
5	Business Division-treatment	-1.060	-1.065
6	Business Division-supplement	-0.490	1.268
7	Business Division-Medical supplies	2.512	-2.975
8	Business Division-medical equipment	-1.342	-1.593
9	Business Division-Consultant/Organization	-1.342	-1.593

10	Business Division-Cosmetics, beauty products	-0.446	-1.985
11	Enterprise scale-Large	5.913	-1.863
12	Enterprise scale-Small	-0.257	0.081
13	Corporate History-Large	5.088	-0.586
14	Corporate History-Medium	-0.776	2.952
15	Corporate History-Short	-0.329	-0.027
16	Country/region (state)-USA	0.016	-1.233
17	Country/region (state)-United Kingdom	-0.853	-0.059
18	Country/region (state)-Japan	2.211	1.569
19	Country/region (state)-European countries other than UK	-0.397	1.353
20	Country/region (state)-Asian countries other than Japan	-0.205	2.172
21	Country/region (state)-Canada	0.191	2.451
22	Country/region (state)-Australia	2.265	2.119
23	Emphasis in design-Large	-0.313	-1.337
24	Emphasis in design-Medium	0.588	1.196
25	Emphasis in design-Small	-0.446	0.727

The resulting category scores, analysed using the Quantification III method, are presented in Table 5, wherein each item within the respective category is assigned a numerical value.

Specifically, categories 1 to 10 represent items related to industries, categories 11 to 12 represent items related to company size, categories 13 to 15 represent items related to company history, categories 16 to 22 cover items related to countries, and categories 23 to 25 encompass items related to the importance of design.

These category scores are shown in their respective cells in Table 5. A scatterplot was then created using this category score data, with the score values for each category plotted on the x-axis as the horizontal axis and the y-axis as the vertical axis.

Essentially, by visually representing the resulting numerical data in a scatterplot, we were able to identify relationships and trends between the different categories.

As a positioning map to confirm the current status of the Femtech market and the positioning of each company (Figure 4), the vertical axis indicates "Business Division". The horizontal axis means "Enterprise scale".

interpreted as "small" and "large". The "Small Firm Size" group is on the left, and the "Large Firm Size" group is on the right.

Looking over the entire area, companies with small business scale, short history, and service development are clustered near the centre. Companies developing supplements are clustered in the upper left area.

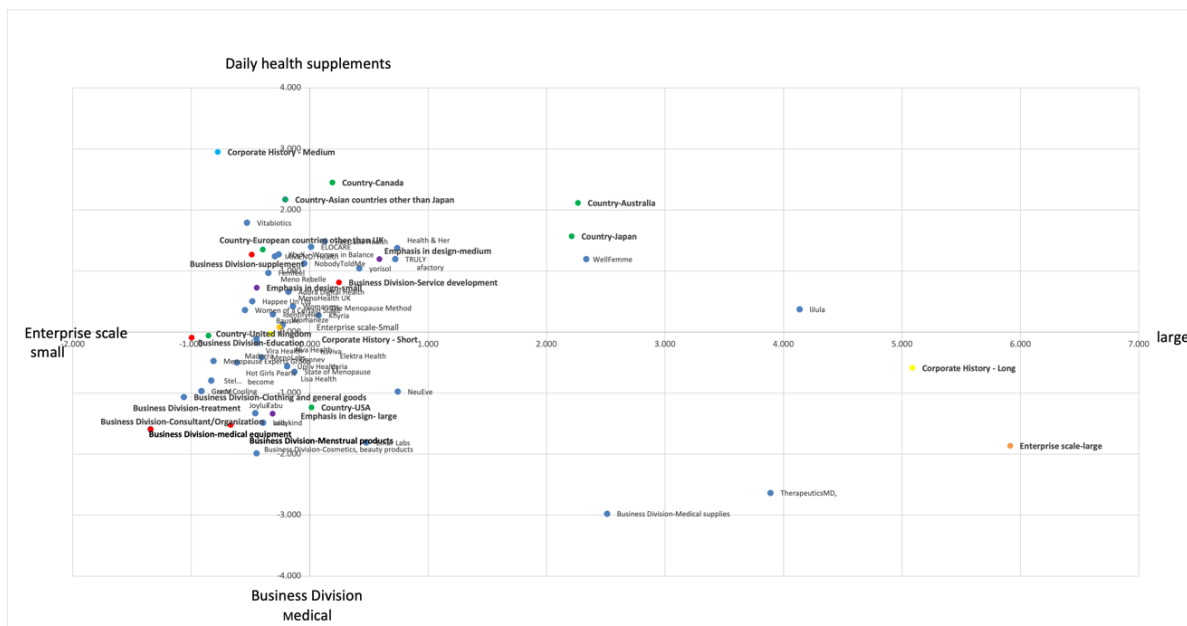


Figure 4. Scatterplot on domestic and foreign Menotech companies as of February 2023.

Down the horizontal axis are U.S. and U.K. firms in small firm size, service development, medical equipment, consultants and organizations, and sanitary products.

Furthermore, many of the US companies were relatively small and had short histories. In the lower right part of the figure, there were two large companies, Liluna (Fuji Seiyaku Kogyo Co., Ltd.) of Japan and TherapeuticsMD of the US.

Overall, the Femtech sector is characterized by a large number of small companies developing services centered in different countries, with many small businesses in the US and the UK. The only areas beyond products and services were education and consultancy/organizations, and there are a few large companies in the pharmaceutical business division. In the future, both small and large companies may increase in number along with the development of the business division.

8 Comparative study on Menotech business in Japan and abroad

8.1 A comparison regarding Menotech business in Japan and abroad

The global Menotech market is mostly dominated by small companies, many of which are based in America, as stated in section 7.3. These companies mainly focus on developing services such as online health care. However, few companies provide education and awareness for women going through menopause, as well as daily health promotion products and treatments.

In Japan, the Menotech market is primarily made up of small companies that are clustered in the digital services business. In contrast, companies in the U.S. and the U.K. have menopause care education and consultant/organization businesses in addition to product and service development. There is a lack of diversity in Japan.

European and U.S. companies tend to emphasize design on their websites, often with a detailed story about the design process. However, in Japan, there is a lack of explanatory content regarding their designs.

As more companies enter the Menotech market in Japan and overseas, the number of large companies and startups may increase, which could lead to the growth of the Menotech market.

A search of academic articles and literature on Menotech via an article search website did not reveal any research articles specific to this area. However, a web search for articles on Menotech found the following article commenting on Menotech's business.

According to the article by Wiederhold, in order for the market to develop well and expand significantly, technology companies need to differentiate themselves by offering added value and health benefits to women. Adequate validation of service design is also essential to demonstrate effectiveness, improve women's health and well-being, and demonstrate positive clinical value (Wiederhold, 2021).

The "Women's Healthcare White Paper 2023 Market Trends Forecast Report," emphasizes that beyond 2023, products and services in the women's healthcare industry will continue to deepen and evolve. There will be a development of cross-selling items, and diversification in development areas. The usage scenarios and target groups will expand, leading to increased awareness and expanded touchpoints (Woman's, 2023).

Kurusu's article highlights that the primary target group for Femtech is women under the age of 40, and there is a current lack of Menotech products and services. However, it is estimated that around 1.1 billion women worldwide will enter menopause by 2025. Furthermore, the growing interest in menopause products and services is evident from NHK's "Menopause for Everyone" specials. As a result, more companies are expected to enter the menopause market (Kurusu, 2022).

Based on the above and previous research, we agree that a greater number of companies entering and supporting the market will contribute to the flourishing of the Menotech market. It is also crucial to understand the fundamental concerns and needs of women and to use technology to provide effective solutions. Given the lack of research in the field of Menotech, it is essential to bring new knowledge and insights to the table.

Due to these factors, the pace of development of the Menotech market in Japan is somewhat slower than in the US and Europe. Nevertheless, through these studies and research efforts, we expect to promote the growth of the Japanese menopause market and make significant contributions to women's health.

8.2 Consideration of Menotech business in Japan Femtech's market

Through the results of data analysis and literature review, we analysed information on Menotech companies in the Japanese Femtech market and compared them with those overseas, to clarify the future direction of Menotech's business development, which is as follows.

8.2.1 Menotech market conditions in Japan and abroad

Against the background of increased investment and corporate activity in the Femtech market, there has been a growing number of Menotech companies both domestically and overseas. Overseas Menotech companies, mainly based in the United States, are mostly newly established startups. Many startup companies seem to be focusing on developing digital services for menopausal women, as they gather in the service development field. In the field of daily health promotion products, there are products such as supplements, apparel and goods, and menstrual products related to healthcare, and

major companies are entering the pharmaceutical field. Based on all these circumstances we predict that the Menotech market will continue to grow, and the high interest in Menotech is expected to continue.

Furthermore, Japanese Menotech firms tend to focus on developing services, especially in the early stages of entering the Femtech market. However, this bias often results in a dearth of well-rounded services and a limited range of products from the Menotech sector.

One of the reasons for this trend is that Japanese Menotech companies fail to provide adequate explanations and emotional elements in their service designs on their websites and in their public relations activities. As a result, they may not fully grasp the importance of service design, the sophistication of customer experience, and responsiveness to diverse needs.

Another contributing factor is related to women's awareness. In a related study, an awareness survey on menopause care was conducted between July and October 2020 among women living in Tokyo, Japan, and Qingdao, China. The results showed that many respondents had negative attitudes toward menopause (Liu, Sato, 2021). Additionally, interviews with professionals in the health tech industry were conducted over two months from May to July 2021, indicating a growing awareness among women regarding their rights. This awakening has highlighted the need to promote Femtech services and products.

These factors have revealed a situation in which Japan lags in the development of new everyday products and services related to Menotech and is also significantly behind in terms of international competitiveness.

8.2.2 Menotech's business development in Japan

Based on the situation in the domestic and international Menotech market, we propose three possible new service designs for menopausal women.

- Product development that meets women's detailed needs

In Hayashi's book "I Want to Know: Advances in Femtech - New Technologies to Improve Women's Quality of Life" (Hayashi, 2022), the importance of promoting quality services for health counselling and health information is emphasized. The authors agree with the view that promoting high-quality services for health counselling and the provision of health information is essential.

Menopausal women's health issues require consideration of their high sensitivity and complexity. Foreign Menotech companies have been successful in offering supplements, clothing, sundries, and sanitary products specifically designed for menopausal women. Menopausal symptoms such as, mental stress, hot flashes, palpitations, insomnia, and various other demand specialized attention. By offering menopausal solutions that address the specific needs of menopausal women, the number of users and the development of menopausal services can be expected to increase.

- Menotech Knowledge Dissemination, Education and Prevention

Menotech's primary target group is considered to be women in their 40s and 50s. However, it is essential for women with physical problems to get in shape before full-fledged menopause and to have as healthy menopause as possible. While gathering information on menopause care companies overseas, we discovered various forms of support, including online

consultations with menopause care specialists, the development of personalized health plans, and the introduction of corporate wellness programs. There were also programs aimed at training individual menopause specialists. In an earlier study, Shima (Shima, 2007) highlighted the challenge of studying women's attitudes and perceptions of menopause. We align with this viewpoint, emphasizing that by expanding opportunities to acquire correct knowledge from their 20s and 30s, women can face menopause with peace of mind and avoid panic before it arrives through well-planned menopause health education programs.

- Expectations for Menotech industrialization through the use of communities and organizations

The Menotech field is currently a niche and small market, which leaves the major challenge. Yoshizawa's study (Yoshizawa, 2000) is consistent with the view that listening to menopausal women is of paramount importance. Stressors play a significant role in influencing the wide range of mental and psychological symptoms experienced during menopause. Therefore, it is very important to listen to the voices of menopausal women, and community organizations are needed to help in this regard. In the U.S., there is a business field of consultants and organizations that investigate, analyse, and understand the problems that menopausal women face with Menotech companies, and develop products and services that menopausal women can appreciate as a contribution to society.

In this aspect, Japan also needs an organization to conduct activities that will revitalize the Menotech business. Specifically, the following strategies should be considered: (1) supporting Menotech's human resource development to strengthen industrial competitiveness, (2) publicizing the utilization and developing regulatory reform projects related to the Menotech business, (3) holding various events and media dissemination.

Expanding on the previous discussion about the methodological nature of service design, the current landscape of growing social interest in women's health issues, and the increasing number of companies entering the market creates a timely opportunity to emphasize functional and emotional value and enhance the customer experience. In this context, it becomes imperative to acknowledge the need for a multi-faceted marketing design, which includes considering users' psychological aspects, providing emotional experiences, offering detailed solutions tailored to their age and lifestyle, and leveraging communities and organizations.

In the realm of research, data validation and the social implementation of designs and insights are also critical components that require attention.

9 Conclusion

In this study, we examined the current state of Femtech companies and products related to the health and support of menopausal women in Japan. We investigated the positioning of each company and the overall market situation based on the Business Division and Enterprise scales of domestic and international Menotech companies and conducted verification and analysis. The following findings were revealed:

- Many small businesses are gathered in service development, testing, and daily necessities, but few large companies are developing products in the field of daily necessities.

- Through literature and data analysis of domestic and international Menotech companies, we found that the Menotech market is in the early stages of development. However, it is expected to have the potential for significant market expansion. However, in Japan's Menotech market, to promote the expansion of the potential market for Menotech and to spread Menotech services, the creation of new products and services is necessary, and dissemination of knowledge and utilization of Menotech communities and organizations are the issues to be addressed.

10 In the end

Japan can be said to be in the early stages of the Menotech era. In future research, we plan to look to Menotech companies overseas and investigate the needs of menopausal women who continue to work to develop services designed specifically for menopausal women in urban areas. Additionally, we intend to propose solutions to the issues identified in this study.

While Menotech is still perceived as being of interest mainly to trend-sensitive women in Japan, there is potential to broaden the scope of Femtech and create new services in this field.

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