Service Design for Improving Postoperative Rehabilitation(PR) Peer Support for Breast Cancer Survivors

Based on Research in Milan and Shanghai

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ABSTRACT

As the global incidence of breast cancer continues to rise, all society sectors realize that this is a challenge that patients and their stakeholders must face together. The innovation of postoperative rehabilitation services for breast cancer patients has become a hot topic in cancer care in recent years. Because breast cancer rehabilitation is a long and tortuous process, patients and their family caregivers must maintain comprehensive and effective chronic disease management of the patient's physiology, psychology, quality of life, and continuous access to peer support. Based on such characteristics of rehabilitation management, service design, as a method focusing on the realization of new values and co-creation among participants, has been tried in breast cancer postoperative management and organically combined with peer support activities. With the development of global internet technology, the management of chronic diseases in smart medical care takes patients as the center to think about service scenarios from different dimensions. Moreover, smart healthcare has become a practical tool for patient peer support and self-management.

This article mainly focuses on the postoperative rehabilitation period of breast cancer patient groups. It discusses the commonalities and differences between postoperative social support, medical system support, and stakeholder peer support in Milan, Italy, and Shanghai, China, from the service design perspective. First of all, the author did a large amount of desktop research, literature reading, data collection, and clarify the critical time frames of rehabilitation. The focus of previous tasks is to get a deeper understanding of how to improve the quality of life, the actual effect of family and peer intervention, and breast cancer-related innovative design development trends. Simultaneously, with the in-depth research on peer support, a one-year qualitative study was carried out in Milan and Shanghai. The needs of target groups in two cities have emerged after in-depth interviews and co-design. According to these, the author obtained insights from different perspectives and then did the localization test to propose the adaptation forms of peer support services in different social structures and medical systems.

In the context of globalization, peer support in different regions and countries cannot form a unified standard frame. This topic research provides the investigation example for understanding the structure of peer support and putting forward the idea of localized

design of peer support services. Moreover, it may assist designers in less developed areas to learn advanced peer support services from developed regions. It has achieved the most reasonable allocation of resources, which has a positive impact on breast cancer postoperative rehabilitation.

Keywords: Postoperative breast cancer patients, peer support, rehabilitation services, service design

Astratto

Poiché l'incidenza globale del cancro al seno continua a crescere, tutti i settori della società si rendono conto che questa è una sfida che i pazienti e le loro parti interessate devono affrontare insieme. L'innovazione dei servizi di riabilitazione postoperatoria per i malati di cancro al seno è diventata un tema caldo nella cura del cancro negli ultimi anni. Poiché la riabilitazione del cancro al seno è un processo lungo e tortuoso, i pazienti e i loro familiari che si prendono cura di loro devono mantenere una gestione completa ed efficace della malattia cronica della fisiologia, psicologia, qualità della vita del paziente e accesso continuo al supporto tra pari. Sulla base di tali caratteristiche della gestione della riabilitazione, il design del servizio, come metodo incentrato sulla realizzazione di nuovi valori e la co-creazione tra i partecipanti, è stato sperimentato nella gestione postoperatoria del cancro al seno e combinato organicamente con attività di supporto tra pari. Con lo sviluppo della tecnologia Internet globale, la gestione delle malattie croniche nell'assistenza medica intelligente porta i pazienti come centro per pensare a scenari di servizio di diverse dimensioni. Inoltre, l'assistenza sanitaria intelligente è diventata uno strumento pratico per il supporto tra pari dei pazienti e l'autogestione.

Questo articolo si concentra principalmente sul periodo di riabilitazione postoperatoria dei gruppi di pazienti con cancro al seno. Discute i punti in comune e le differenze tra il supporto sociale postoperatorio, il supporto del sistema medico e il supporto tra pari delle parti interessate a Milano, in Italia, e Shanghai, in Cina, dal punto di vista del design del servizio. Prima di tutto, l'autore ha svolto una grande quantità di ricerche desktop, lettura della letteratura, raccolta di dati e chiarimento dei tempi critici della riabilitazione. L'obiettivo dei compiti precedenti è quello di ottenere una comprensione più profonda di come migliorare la qualità della vita, l'effetto reale dell'intervento della famiglia e dei pari e le tendenze di sviluppo del design innovativo legate al cancro al seno. Contestualmente, con l'approfondita ricerca sul peer support, è stato realizzato uno studio qualitativo della durata di un anno a Milano e Shanghai. Le esigenze dei gruppi target in due città sono emerse dopo interviste approfondite e co-design. Secondo questi, l'autore ha ottenuto intuizioni da diverse

prospettive e quindi ha svolto il test di localizzazione per proporre le forme di adattamento dei servizi di supporto tra pari in diverse strutture sociali e sistemi medici.

Nel contesto della globalizzazione, il sostegno tra pari in diverse regioni e paesi non può formare un quadro standard unificato. Questa ricerca sull'argomento fornisce l'esempio di indagine per comprendere la struttura del supporto tra pari e proporre l'idea di progettazione localizzata dei servizi di supporto tra pari. Inoltre, può aiutare i progettisti nelle aree meno sviluppate ad apprendere servizi avanzati di supporto tra pari dalle regioni sviluppate. Ha ottenuto l'allocazione più ragionevole delle risorse, che ha un impatto positivo sulla riabilitazione postoperatoria del cancro al seno.

Parole chiave: Pazienti con cancro al seno postoperatorio, supporto peer, servizio di riabilitazione, design del servizio

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Chapter 1 Background Introduction

1.1 Research background

1.1.1 Social background: status and the development trend

The number of confirmed breast cancer patients has increased significantly worldwide. According to the report data of "Global Cancer Statistics 2018", the incidence of breast cancer (24.2%) and mortality (15%) among women rank the highest [1]. Moreover, according to the report "The Status and Trends of Cancer in China in 2017" released by the National Cancer Center of China, the incidence of breast cancer ranks first among female malignant tumors. The average 5-year survival rate for breast cancer in the United States is 90%, compared with 73.1% in China. The incidence of breast cancer in China is lower than that of western countries, but the growth rate ranks first globally. The incidence rate in first-tier cities such as Beijing, Shanghai, and Guangzhou is close to developed cities in Europe and America [2].

A large number of patients receive different treatments because of their different levels of social and medical development. What expected is that patients who undergo complex physiological changes during surgery and chemotherapy are prone to severe psychological stress reactions [3]. Patients encounter many difficulties on the road to recovery, and their family members and friends are also facing various pressures. However, the current research in related fields in worldwide focuses on solving clinical treatment problems and neglects the long-term adaptation establishment of patients after returning to their families and the society.

In summary, with the continuous improvement of diagnosis and treatment methods after breast cancer surgery and the prolonged survival of patients, clinicians will face a more complex and multidimensional individual postoperative recovery situation. Postoperative rehabilitation research has gradually focused on the recovery of the patient's overall body function, psychological reconstruction and rehabilitation, and improved quality of life from the traditional wound care technology. Medical institutions and government levels also increase investment in related personnel training and course organization to create a better environment for peer support and social support.

1.1.2 Medical background: key factors affecting the recovery of breast cancer

patients

(1) Different stages of postoperative rehabilitation and critical time nodes after surgery
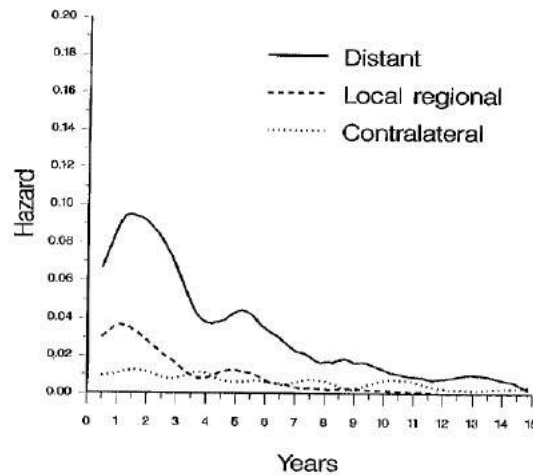
Figure 1.1 Hazard function for distant metastases, local-regional
recurrence, and contralateral breast tumor
Source: Romano, Demicheli, Antonello, et al., 1996

In 1996, Dr. Romano Demicheli first proposed a bimodal model for the time distribution of breast cancer recurrence risk after surgery. The model is shown in the figure above. The second and fifth years after surgery are two peaks, and the peak of the 2nd year is higher than the 5th year[4]. This model still has a remarkable reference value, and subsequent postoperative clinical studies in various places have also verified the model universality. Therefore, the five-year survival rate is adopted as the time node to measure various curative effects [5]. Although five years is a vital milestone, it does not mean that the patient will not have the possibility of recurrence in the future.

In 2017, the American Society of Clinical Oncology (ASCO) published a report on the Late Recurrence risk after breast cancer surgery. The report pointed out that the risk of breast cancer recurrence is the highest in the first two years after surgery, and the risk has steadily decreased over time. The late recurrence of breast cancer appears after a small peak of recurrence in 5 years, and many patients start to take it lightly after the 5-year peak of recurrence which leading to late recurrence unexpectedly. It can be seen that patients need to remain vigilant for a long time and have an in-depth understanding of factors related to the potential risk of late recurrence of breast cancer. Doctors, scientists, and researchers have determined that these factors are related to the age, the stage of cancer diagnosed, hormone receptor status, genetic information, and the degree of lymph node impact.

It can be seen that the 5-year survival rate alone is not accurate enough to evaluate the cure rate of breast cancer, and the 15-year survival rate can better reflect the therapeutic effect of

long-term follow-up.

(2) Factors affecting physical rehabilitation, psychological rehabilitation, and quality of life

After undergoing breast cancer surgery, patients face a long and challenging journey of treatment and recovery. Among them, the following five points are the essential steps that the American Society of Clinical Oncology recommends that patients recover their overall health after surgery: First, seek social support emotionally, establish healthy interpersonal relationships, obtain mental health services, and manage life stressors actively; Second, maintain a healthy diet, intake of fresh fruits, vegetables, and lean meat; Third, adhere to moderate physical exercise to maintain a healthy weight and reduce the risk of diabetes, high blood pressure, other cancers and chronic diseases; Fourth, insist on follow-up care and other health checks, and maintain close communication with medical staff; Fifth, use hormone therapy regularly, and discuss adjustment measures with the doctor when encountering side effects of endocrine therapy.

In addition to the above five crucial steps, targeted physical rehabilitation exercises and psychological self-image reconstruction of the affected area are essential processes for patients after breast cancer surgery, and it helps them return to the right track of life, and return to professional positions. Targeted physical exercise on the affected area helps the patient better cooperate with the doctor's instructions and return to the average physiological level before the operation as soon as possible. Peer support includes the mutual support of patient peers during treatment in the hospital and the encouragement and companionship of family and friends. At this stage, patients will face a series of obstacles from the physical, psychological, and external environment, and they need to be scientifically guided through design methods so that patients can get more comfortable and humanized role transition and revert from the patient role to the normal person role.

1) Related factors affecting the physical rehabilitation of patients after surgery
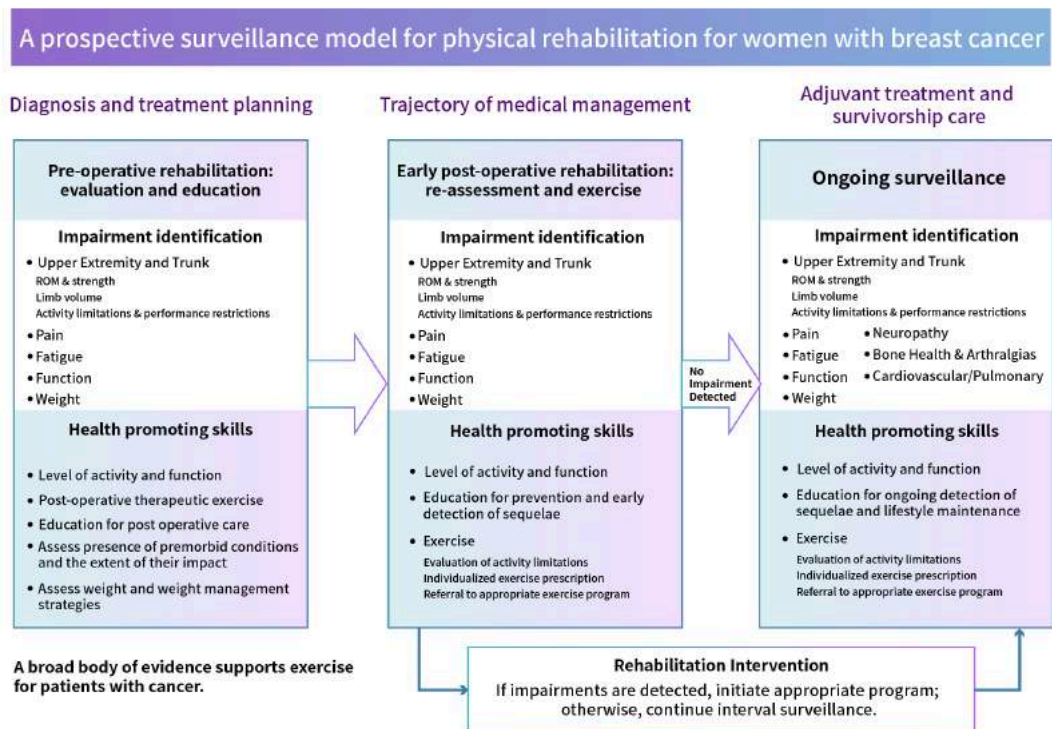
Figure 1.2 A prospective surveillance model for physical rehabilitation for women with breast cancer
Source: Stout, N. L., Binkley, J. M., et al., 2012

In 2012, the American Cancer Society released a monitoring model for female breast cancer and proposed a prospective patient survival medical care method [6]. The postoperative continuous monitoring section shows that the patient needs to maintain upper limb exercises in the early recovery stage 1-2 weeks, and reassess the visit one month after surgery. Under the premise of weight control, the sequelae of surgery are dealt with, focusing on the degree of fatigue, functional changes, neurological perception, weight fluctuations, changes in bones and joints, and changes in cardiopulmonary vascular function [7]. In the behavioral pattern exercise education, medical staffs must evaluate the limitations and individual characteristics in advance, give targeted prescriptions, and provide professional-related rehabilitation institutions if necessary.

In China, the Xinjiang Autonomous Region Traditional Chinese Medicine Hospital proposeed aerobic exercises and Tai Chi exercises for elderly postoperative patients. Tai Chi exercises were carried out based on conventional rehabilitation training, so that elderly breast cancer patients aroused their subjective initiative and improve life quality. Upper limb function rehabilitation peer group activities have a wide range of medical value [8].

2) Related factors that affect the postoperative psychological rehabilitation of patients

A 5-year follow-up study based on the psychological response and survival status of a large number of breast cancer patients published by the Department of Psychological Medicine at Royal Marsden Hospital in the United Kingdom showed that the helpless/desperate psychological pair measured between 4 and 12 weeks after the initial diagnosis The survival rate of patients with early breast cancer has an impact [9]. The Plastic Surgery Hospital of the Chinese Academy of Medical Sciences and Peking Union Medical College announced a survey report on the psychological impact of 90 patients with postoperative breast defects after breast cancer. The main clinical manifestations of the patients are the fear of physical impairment, sexual life quality depression, work and social activities obstacles [10].

Furthermore, postoperative breast cancer patients face three significant psychological rehabilitation problems: the adjustment of the relationship between husband and wife, the transition to return to the workplace, and the anxiety for recurrence prevention. The absence of breasts makes the patient show signs of pessimism, reticence, and lack of interest in the surrounding things, the self-image disorientation. Due to the decline of the body's immune function, patients will question their own occupation ability. In this case, some patients will overwork to force themselves to re-adapt in the workplace, which hurts psychological rehabilitation [11]. The pathological features of breast cancer make the patient feel restless for many years after the operation, and the long follow-up observation process makes the patient feel lax. Given the above three points, the patients themselves should actively seek peer support and communicate with family caregivers and medical staffs positively. The patient's spouse and colleagues should also obtain professional psychological counseling and education to relieve their negative emotion. Under the joint effort, the patient will gradually return to a healthy and peaceful mental state.

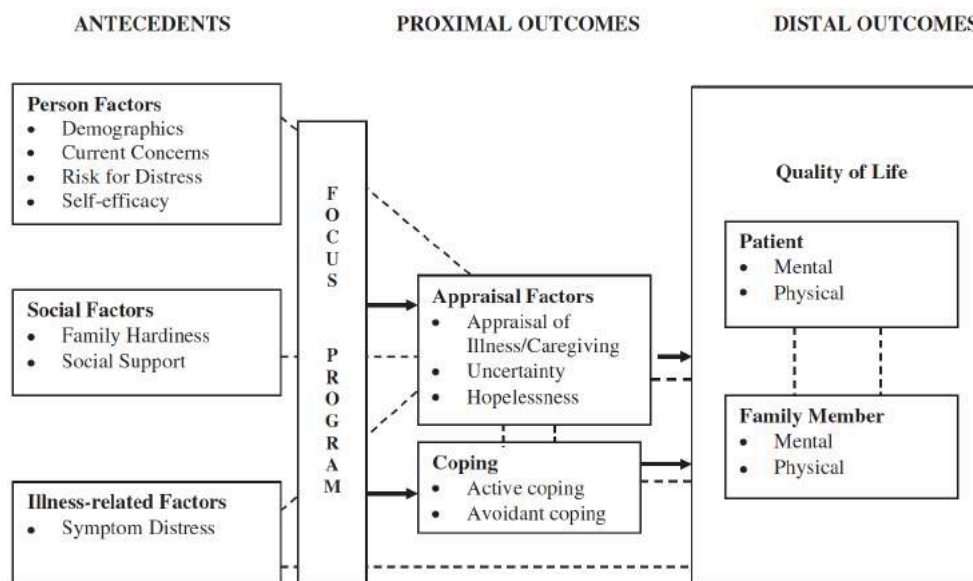## 3) Related factors affecting the overall quality of life of patients

Figure 1.3 Theoretical model of factors affecting patient and family member quality of life.
Source: Northouse, L., Kershaw, T., et al., 2005

The quality of life refers to the experience of different cultures and value systems of people's life goals, expectations, standards, and the life state of things they care about, including four aspects of individual physiology, psychology, social function, and material state (WHO.1993) [12]. Laurel Northouse, a scholar at the University of Michigan School of Nursing, conducted a randomized clinical experiment called Focus Program to consider the impact of the family intervention on the postoperative quality of life of patients. 134 patients and their family caregivers are divided into half as routine care (control group) and routine care plus family intervention (experimental group). Perform effectiveness evaluations were conducted at the three-month and six-month. There are five main intervention methods, including enhancing family participation, cultivating optimism, enhancing the ability to cope with problems, reducing uncertainty, and managing specific symptoms. The results showed that the reported despair rate and negative evaluation of the disease in the experimental group were significantly lower than those in the control group, and the negative evaluation of their nursing staffs was significantly reduced. The model derived from the experimental results shows that personal factors, social factors, and disease treatment-related factors directly affect the evaluation indicators under the proximal outcome and the copying mode [13]. As seen in the Figure 1.3, bold lines and arrows indicate hypothesized direct and indirect effects of intervention on proximal and distal outcomes. Dotted lines indicate significant relationships among study variables observed from previous studies.

In 2008, the School of Nursing of Xinjiang Medical University and the School of Nursing of the Hong Kong Polytechnic University investigated 126 breast cancer patients in a tertiary hospital in Urumqi and analyzed related factors. The study found that the self conscious and social adaptability deteriorated with the change of secondary sexual characteristics, and the psychological states such as anxiety, depression, and fear reduced the quality of life. The

earlier clinical treatment adaptation and the more social support patients receive from medical staff, families, and social organizations, the higher the quality of life[14].

Therefore, to improve the overall quality of life, it is necessary to start from personal physiology and psychology and pay attention to social function factors. The short-term pathological and psychological recovery assessment and the long-term social environment construction need to rely on a professional medical team, family caregivers, and community stakeholders.

1.1.3 Design background: Application and development of service design in this field

(1) The development background of the application of service design in the medical field

As a collaborative and creative method that focuses on realizing new co-design value among participants [15], service design mainly focuses on public medical services in the medical field [16]. Its characteristics, such as co-design collaborative design from the perspective of service skills, user-centered design, and user-centered methods [17], have a unique value in responding to changes in significant challenges in the medical field today [18].

According to the 2002 report of the British National Health Service (NHS), the medical field has gradually changed from infectious or other diseases to chronic diseases. Certain amount of studies have shown that chronic diseases are closely related to the community, and influence the quality of life. The relationship between people and the outside world is significant. Experts such as Cottam pointed out that the co-design method conducted in the community have significant responses to this challenge. Simultaneously, traditional service design focuses on improving the entire system and healthcare process, but it is some how not enough to meet the chronic disease care challenge. Experience-Based Co-Design (EBCD) has also come into adopted in recent years by improving the user experience [19].

(2) Specific cases of service design methods applied in the medical field

In traditional concepts, users are regarded as passive recipients of products or services. With the development of innovation attempts, users began to participate in innovative projects as an indispensable factor[20]. The user-centered rule in the medical-related design process has gradually shifted to the user's experience as the center. EBCD was developed by Bate and Rober. This method is based on understanding the user's feelings and experience when contacting services or processes, putting patients' and employees' feelings at the core, and treating patients and employees as equal participants. EBCD has been used in England, Scotland, New Zealand, and other places after it was proposed. Its application scope involves clinical services for head and neck cancer, diabetes outpatient services, breast cancer screening, etc.

Not only for existing diseases, guiding people to develop good habits are also a major trend

in the current medical field [21]. Correspondingly, designers have gradually shifted from helping patients solve health problems, such as designing medical products or services, to promoting a healthy lifestyle. In this trend, service design can also play a essential role. For example, in 2016, Philips designed and proposed the eIAC plan to enable stakeholders in clinical treatment and social support to identify and resolve the root causes of repeated hospital admissions. Creating this healthcare system will help reduce the number of hospitalizations while providing the highest level of care for patients with many chronic diseases. The eIAC service advocates combining leading telemedicine technology to monitor and educate patients through the patient portal (eCare Companion patient application). In 2017, Idoso Zilda Arns Hospital for the Elderly (HIZA) in Brazil had a bad reputation due to low patient satisfaction. The service designer team analyzed the patient's medical treatment process through shadowing and used other service design tools to allow patients and stakeholders to participate in the conception and prototype design sessions. The solutions are ranked according to problem priority, feasibility, and influence. The final data showed it reduced patient anxiety and increased participation in decision-making. The well-known design consulting company Continuum created a new type of elderly care model that breaks through the existing medical system for Caesars Medical Group in the United States. The integration of offline hospitals, families, and community resources combined with the online community construction is smoothly described through stories, concepts, scenarios, and interactive prototypes.
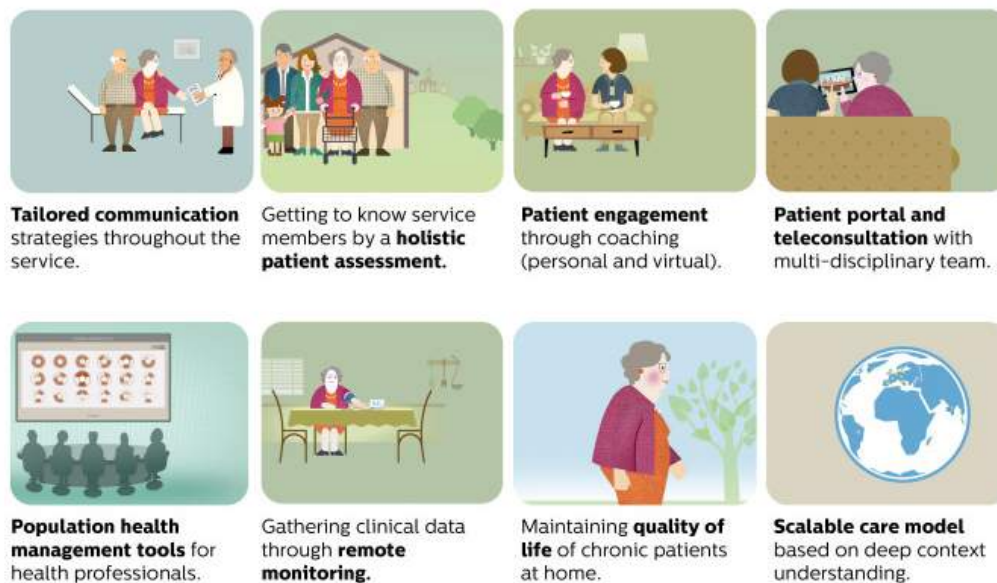
Figure 1.4 Philips eIAC service process storyboard
Source: SDN website
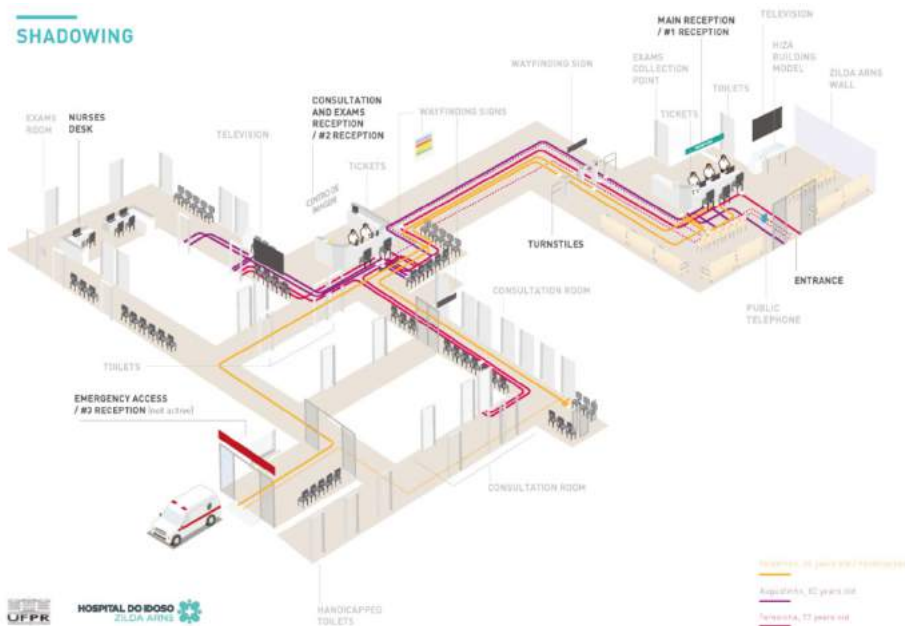
Figure 1.5 Visualization of shadowing survey in Idoso Zilda Arns Geriatric Hospital in Brazil

Source: SDN website

1.2 Research status of this field

1.2.1 Service design intervention in diagnosis, treatment, and rehabilitation services

In recent years, service design has begun to intervene in breast cancer diagnosis and treatment. The vast majority of successful design cases focus on pre-examination and initial diagnosis of breast cancer. The design involving postoperative rehabilitation is based on the spontaneous curriculum activity structure innovation of NGOs. Most public medical institutions in developed regions in Europe and the United States provide scientific rehabilitation process guidance and continuous services through mail and phone tracking during the continuous observation period. The Experience-Based Co-Design (EBCD) service design tool is derived from King's College London and is a patient-centered care project in the King's Comprehensive Cancer Center. The project used EBCD tools to improve patients and employees experience which applied in at least seven countries/regions. In addition to the routine follow-up services of medical institutions for patients after surgery, service design is frequently used in self-examination and hospital diagnosis processes [22]. In 2017, a London designer named Corrine Ellsworth Beaumont on Facebook launched the "Know Your Lemons" activity. She optimized online application tutorials and offline screening guidance to make the entire breast self-examination more visible, efficient, convenient, and easy to understand. In 2015, the well-known service design company Designit cooperated with Oslo University

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Hospital to rethink the entire referral and diagnosis process of breast cancer patients using service design, creating a new patient journey and improving the team structure. The efficiency of daily consultations allows patients to get the final diagnosis and treatment plan within four days.
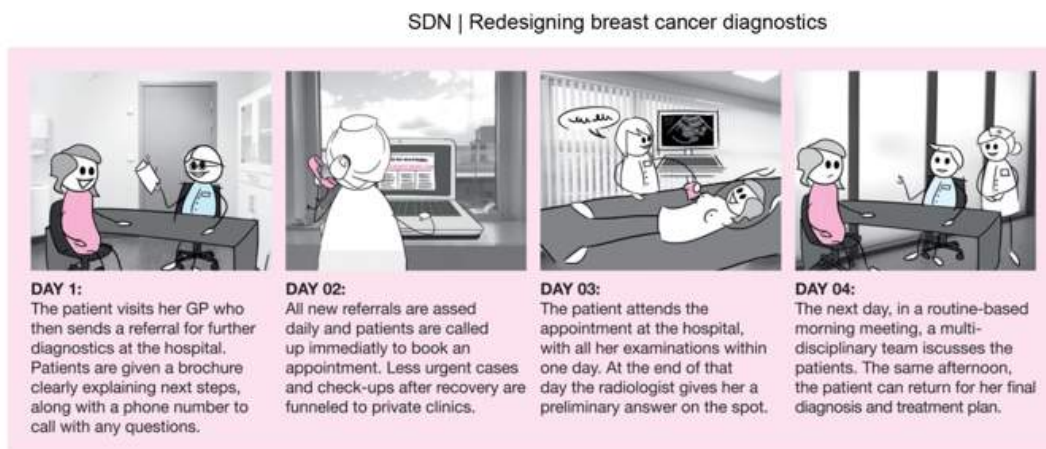
Figure 1.6 Storyboard of the new diagnosis process at Oslo University Hospital
Source: Designit website
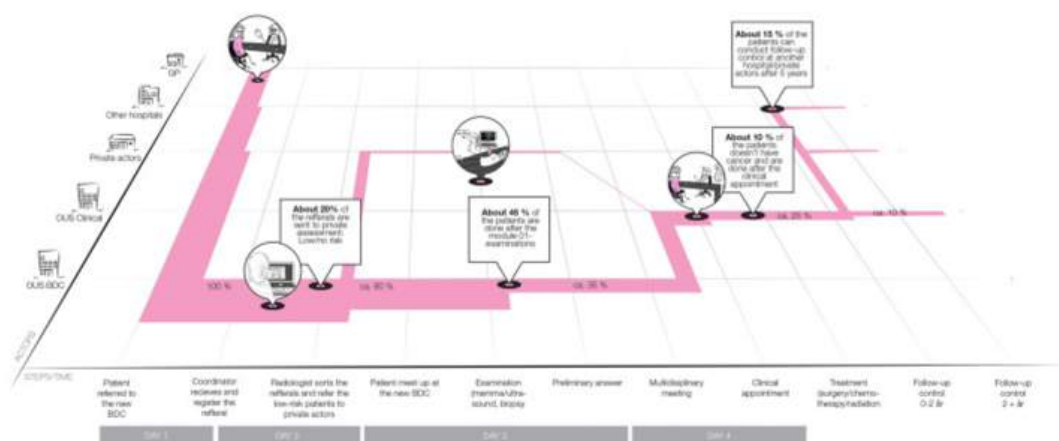
Figure 1.7 The diagnosis journey of new users of breast cancer patients at Oslo University Hospital
Source: Designit website

In Italy, many well-developed non-governmental organizations are dedicated to helping breast cancer patients to heal their whole bodies after surgery. They are closely connected with cancer medical institutions and provide breast cancer patients and their stakeholders with high-quality curriculum design to restore a healthy life. Salute Donna Women's Health Organization provides various rehabilitation courses for patients after cancer surgery, for example, Cascina Rosa healthy cooking courses, Moira meditation psychological communication activities, and Nording Walking field walking rehabilitation courses, etc. The

Moira course follows the EBCD principles and provides cancer patients with opportunities for peer support to promote patients' physical and mental recovery. The Lilt Cancer Foundation established an accompanying treatment program for breast cancer patients. Volunteers use accompanying therapy to provide transportation support for patients to and from the hospital. The ArtLab activity organizes postoperative patients to participate in various art classes, from yoga meditation to painting and vocal music and builds a communication bridge for their companion support.

Figure 1.8 Cascina Rosa healthy cooking course introduction
Source: Salute Donna website

Figure 1.9 Nording Walking field walking course
Source: Salute Donna website

In China, most breast cancer-related designs remain at the stage of public welfare

propaganda and do not have a service design thinking framework. The "Pink Ribbon" mainstream media propaganda activities dominate in psychological lectures and short-term non-sustainable seminars organized by national medical institutions and non-profit organizations. However, there are still cases of service design that are worth learning. In 2013, the 5% Design Action team in Taiwan redesigned the free breast cancer screening method in the community called "Afternoon Breast Inspection", the team ran an mobile inspection car, and optimized a warm environment for reducing the psychological burden of users. The innovative screening promotion method is still producing positive social effects.

Figure 1.10 The service scenario of the " Afternoon Breast Inspection " project
Source: Sohu News

1.2.2 Comprehensive management in the context of smart medical treatment

As a kind of chronic disease management, postoperative management of breast cancer has a complicated etiology and protracted treatment. Based on these characteristics, family caregivers need to invest in continuous spiritual attention and physical care. The quality of patients' rehabilitation is closely related to the overall quality of life of the family. The adverse consequences caused by poor management of patients and family caregivers will increase the public burden of society [23]. Postoperative management of breast cancer also follows the model of chronic disease management. There are three main models: community management, continuous care, and self-management. Community-based management relies on the radiation network of the community health service centers. It relies on its original community influence to improve the living habits of the target population, reduce harmful factors, and achieve comprehensive community management. Patients can obtain coordinated and continuous care services when they undergo transfer from different medical institutions and health management sites and reduce the risk of getting worse. The self-management model requires patients to mobilize the individual's enthusiasm fully, record personal life data (blood pressure, blood sugar, heart rate, etc.) and behavior data (diet, rest time, medication, etc.), and maintain close contact with medical staffs [24].

In the context of smart medical care, the information network connects individual patients and their communities, as well as medical service providers. The information flowing in the network includes the patient's biological and behavioral data. Because the data is instant,

multidimensional, and changing, it requires an intelligent database and processing system. Information visualization is the focus of effective communication in the process of human-computer interaction. On the interface display, data is transformed into text or images to convey content. The consistency principle of the overall color, visual elements, and other design factors can be used to new products. Other visualization methods such as image metaphors, dynamic multimedia effects, pseudo-materialization, and other visualization methods may make interactive pages clear, rich in content, and interesting at the same time [25]. The development of the Internet of Things technology has broken the barriers of information flow between different smart devices. The carrier of time and space limitation no longer disturbs the collection of information. After the patient continues to release the physiological data, he can read and understand the information through the visual interface. The follow-up treatment will also be smoother and clearer.

The development of new technologies such as the Internet, the Internet of Things, and cloud computing has promoted smart healthcare in the field of chronic disease management. In 2009, IBM Technology Company took the lead in proposing smart medical care, and the health services of the medical industry are moving towards informatization, intelligence, and automation. At present, smart medicines are widely used in the field of chronic disease management. For example, in 2014, the MJFF Parkinson's Disease Research Foundation cooperated with Intel Corporation to conduct in-depth research on Alzheimer's disease using a big data platform. The platform used smart wearable devices to detect the patient's physical signs and build the digital model based on the real-time data obtained. At present, smart products related to breast cancer are scarce in the market, and the searchable product functions focus on pre-checks phase.

For example, the iTBra developed by the medical technology company Cyrcadia Health monitors the blood flow and temperature changes in the chest tissue to determine whether the user has cancer cells. The detection time is 12 hours, and the R&D team has completed 500 sample tests with an accuracy rate of 87%, which is slightly higher than the 83% of traditional mammography. In 2017, 18-year-old Mexican student Julian Rios Cantu designed smart underwear called Eva to detect early breast cancer and won the World Youth Invention Award. The product uses about 200 biosensors to monitor specific data such as breast temperature, size, and weight. The user only needs to wear it for 60 to 90 minutes a week to complete the test. The test data is recorded in the associated mobile phone App, and the user can know whether breast lesions occur at any time [26].

Figure 1.11 The promotional image of iTBra Smart Underwear
Source: The Cyrcadia Health website

Figure 1.12 The Eva Smart devices
Source: The Eva website

1.2.3 The application of peer support therapy

In the existing literature and projects, peer support is defined by the functions it provides.

Due to the enormous differences in the social environment and medical systems in different regions, the medical resources obtained by individual patients are uneven, and the development model of peer support is also relatively different, so there is currently no "only completely universal model" in the world [27]. Peer supporters usually have personal experience of the same diseases or similar physical conditions. Take breast cancer as an example, many peer supporters are patients after breast cancer surgery, their family members, or medical caregivers. However, in some specific social situations, peer supporters can be community residents who are enthusiastic about community health education and publicity, also known as community health workers[28]. The main content of peer support includes postoperative physical rehabilitation exercises, emotional sharing, and psychological counseling. Peer support supervisors are supposed to continuously evaluate the patient's rehabilitation effect, provide praise and encouragement to patients who complete the goals as required, and give help for those who have not completed them.

At present, in developed countries in Europe and the United States, peer support is combined with the local primary medical system in various forms. Most of peer support therapy in China is used in the observation phase of patients' postoperative stay in the hospital, mainly in offline communication involving breast cancer patients, medical staffs, and volunteers. Besides, a small number of firms have developed into social media knowledge sharing and online discussion groups after patients are discharged from the hospital from time to time. Both offline and online channels have achieved remarkable results. Since peer support is the main concept of this thesis, the application model of peer support in different social contexts, medical systems is also the discussion focus. The author will explain in detail in Chapter 2 and Chapter 3.

1.2.4 Analysis and summary of research status

(1) Service design status of interventional breast cancer diagnosis, treatment, and rehabilitation services
In Europe and the United States, service design is an effective tool to enhance patients' medical experience and protect patients' medical benefits. From breast cancer patient self-examination to medical institution visits, as well as social organizations and community follow-up rehabilitation education. There are successful application cases demonstrate patients' satisfaction with seeking medical treatment has increased significantly. In China, service design education is carried out in significant design colleges and universities, and there is continuous localized development in theoretical research. However, due to the lack of practical applications in the medical field, it is difficult for designers and medical-related practitioners to collect real user data for in-depth demonstrations and design iterations.

(2) Comprehensive postoperative management of breast cancer patients in the context of smart medical care
Technologies such as the Internet, the Internet of Things, and cloud computing have been widely used in chronic disease management. However, postoperative breast cancer

management as chronic disease management has no successful cases related to smart medicine. Breast cancer-related Internet medical products have been put into production for user self-examination and pre-screening. The research and development of the breast cancer postoperative management section is a blue ocean.

(3) The application of peer support therapy in the postoperative management of breast cancer patients

Since peer support varies according to the medical system and social structure where the project is located, it has excellent research value based on the local social characteristics during the localization process. The author will further develop the concept of peer support in Chapter 2，and do analysis of domestic and foreign peer support application cases.

According to the research status of the above-mentioned related fields, looking at the rehabilitation management cases of breast cancer patients at home and abroad, there is a lack of service design innovation for the postoperative stage. Service design as a critical method involved in breast cancer diagnosis and treatment cases is mainly reflected in the visualization of doctor-patient communication, collaborative innovation of medical teams, community activities, and NGO curriculum innovation. Smart medical technology is an essential tool for postoperative management, it also provides a platform for peer support which connecting all stakeholders efficiently. The author connects the critical points with strong relevance under the three focus areas to create opportunities for activate ideas. This article will focus on studying implementation methods of peer support provided by family caregivers to patients and comparing and analyzing the commonalities and differences of peer support provided by family caregivers in Milan and Shanghai. Combined with the integrated design of the smart mobile platform of smart medical care, solutions are proposed by service design thinking tools.
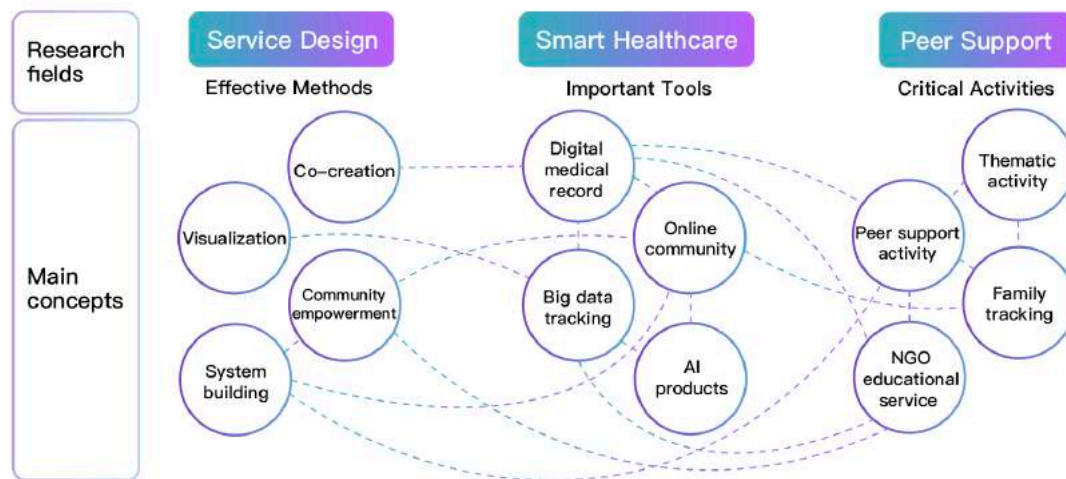
Figure 1.13 Case research analysis
Source: The author made

1.3 Research purpose, innovation, and value

1.3.1 The purpose of the research

Through research in the field of designing interventional breast cancer postoperative rehabilitation in the current smart medical context, using the method of service design to find the key points to improve the quality of life of patients after surgery, and in-depth investigation of the actual needs and experience of postoperative patients and their family caregivers Pain points. Use the communication link between patients and family caregivers as the entry point to enhance individual management enthusiasm at the four levels of physical, psychological, social function, and secular state. They compare the social environment and medical system of breast cancer rehabilitation in Milan and Shanghai, analyzing the current application of peer support in different social and cultural contexts, summarizing specific rules, and forming a knowledge framework. During the process, it Follows the double-diamond model process in design practice, produces a set of service tools that help patients and family caregivers implement peer support more effectively, implements adaptive re-innovation strategies to deal with the differences between Milan and Shanghai, and designing solutions centered on users. Finally, it makes interactive and customized adjustments to enhance the practical value of the design plan.

1.3.2 The innovation of the research

Research object: The research object of this thesis is patients after breast cancer surgery. The physiology and psychology of this population have prominent unique characteristics. The author explored this population's characteristics through sufficient desktop research and in-

depth field research to understand their pain points. The working flow and supporting mode of medical staffs and other stakeholders are the critical touchpoints in the postoperative rehabilitation journey from multiple perspective.

Research process: The most significant innovation of this article is to compare the social environment and medical system of breast cancer diagnosis and treatment in Milan and Shanghai and make local adjustments to the research methods and design schemes according to the characteristics of the two places. The two cities are both international cities and economic centers. They have similarities in overall development planning. However, due to the differences in social structure between China and Italy, the postoperative peer support medical care, and social guidance experienced by patients in the two places are quite different. In the comparison, the author uses innovative thinking to make quantitative and qualitative analyses to enhance the research credibility. The process of adjusting and adapting Milan's design plan in Shanghai is also to explore how to localize peer support service resources under different social environments and medical systems. Readers may learn from the design process and gain insights about how to do re-innovate based on the characteristics of local patients.

1.3.3 The applied value of the research

As the incidence of breast cancer in worldwide continues to rise, all sectors of society have increased their investment in medical research and development and public resources for breast cancer diagnosis and treatment. In recent years, countries have made incredible breakthroughs in preventive screening and clinical treatment, and the differences in related medical quality are shrinking. However, there is a significant gap in postoperative patient management development in various countries, and the underlying causes are complex. This study compares the peer support models in Milan and Shanghai to explore the possibility of service design intervention postoperative management in different social contexts. The author obtains different insights based on the feedback collection of patients in the two places, and give impetus to design outcome according to this. Therefore, this research can inspire new ideas for Chinese and Western breast cancer patients' peers to support the cross-cultural practice of experienced designers, and provide peer-supported service innovation cases for breast cancer postoperative care medical institutions and social organizations at the same time.

1.4 Research method and process

1.4.1 Research methods of the thesis

In specific research and exploration, the author comprehensively used the literature research, data analysis, induction, observation, shadowing, (structured/semi-structured) interview,

deductive method, etc., and used alternately with the tools of service design.

Literature research method:
Collect and consult a large number of related works of literature, journals, electronic bulletins, etc. on the long-term management;
Collect and sort materials to form a personal knowledge structure framework and breast cancer rehabilitation treatment.

Data analysis and induction:
Study the differences in European and Chinese social, cultural, and medical backgrounds;
Conduct extensive data collection;
Summarize and analyze well-known cases related to peer support;
Sort out the service design theories used in the cases;
Discuss The feasibility part of the case.

Observation method:
Observe the breast cancer community diagnosis and treatment in Milan during the field investigation;
Compare similar institutions in China;
Examine how Milan's more advanced postoperative rehabilitation courses can create better service and interactive experiences for patients;
Collect its methods and approaches and In the follow-up theoretical research and design practice integration.

Shadow plan:
Integrate comments from peer support treatment of patients, family caregivers, social organization workers, and medical staffs;
Observe their various behaviors and experiences and understand the instant interaction between different roles and different service touchpoints in the service process;
Record first-hand information with text, images, and photos to facilitate the author's subsequent analysis and insight.

Interview method:
Use precise population structured interviews, semi-structured interviews, and unstructured interviews to clarify the various descriptions of breast cancer diagnosis and treatment institutions, social-related non-profit organizations, and communities;
Record the different psychological feelings given to patients in different scenarios. Moreover, summarize the real needs of patients in different social and cultural backgrounds.

Deductive method:
Do comprehensive analysis of predecessors' summary concepts and innovative methods and topics;
Show the story flow in the innovative design plan in front of patients, narrate and interpret it vividly to obtain the most accurate user feedback.

The above research methods are used in conjunction with service design tools, such as stakeholder diagrams, service blueprints, user journey diagrams, user portraits, collaborative innovation design, etc.

1.4.2 Research process of the thesis

The author makes a step-by-step approach, clarifies the general direction of the research by analyzing the social, medical, and design background, and looks for innovative opportunities for the subject through the current status of research service design, smart healthcare, and peer support in the field of breast cancer postoperative rehabilitation. Then, the author analyzed the fundamental concept of "Peer Support" and demonstrates the practical significance of the research. Next, the author conducted many field investigations in Milan and Shanghai and summarized the comparative insights supported by peers in the two cities in a qualitative manner. The design output was then derived from relevant insights, and service evaluations were conducted to verify the effectiveness of the service design. In the final design outlook stage, the author summarized the research findings and showed future iterations of the study.
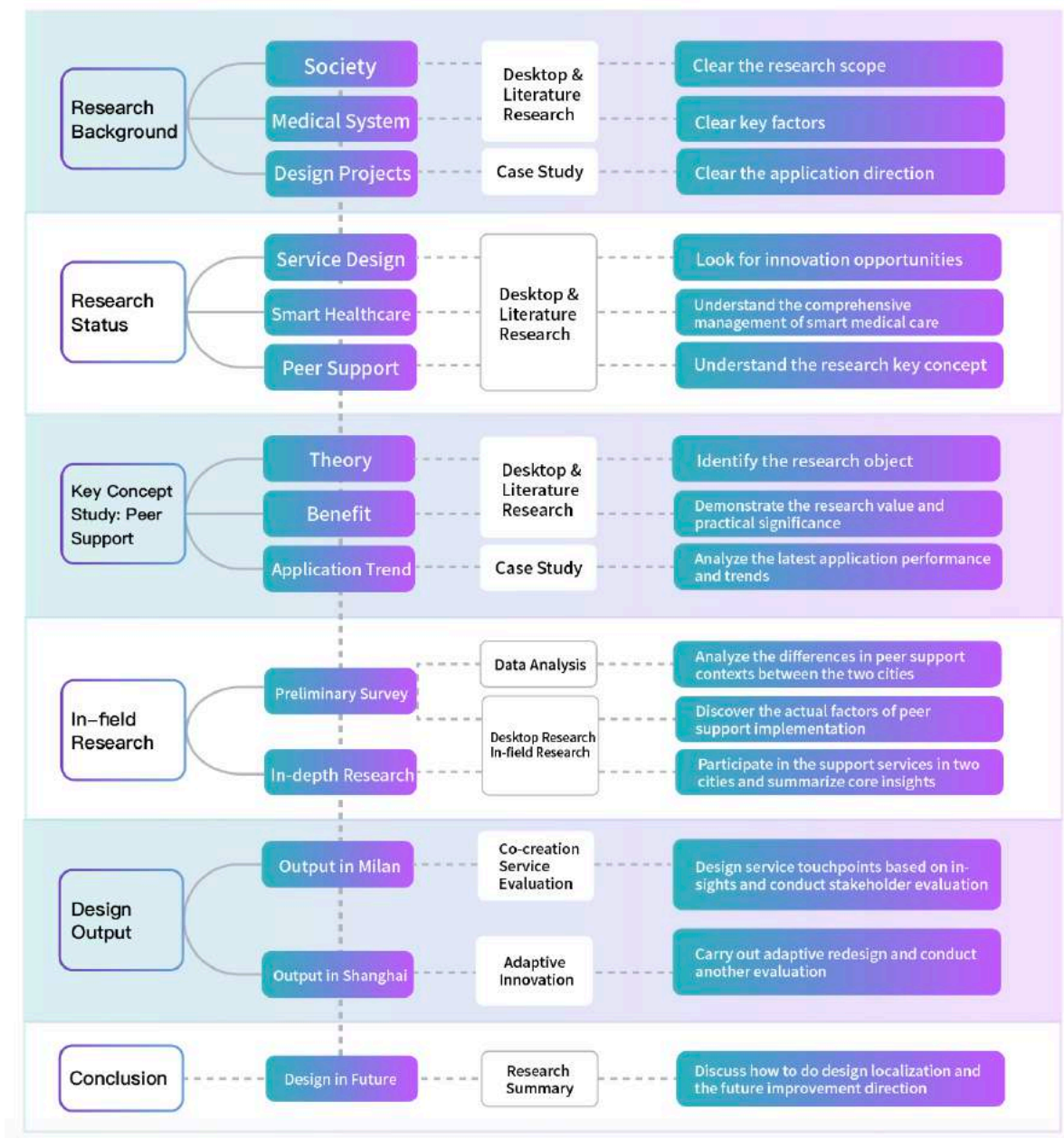
Figure 1.14 Project research flow chart
Source: The author made

Chapter 2 Peer support

2.1 The concept of peer support

Peer support connects patients with similar chronic diseases that require long-term management. Patients with similar diseases can share knowledge and experience, including knowledge and experience that many medical workers do not possess. Related support is equal, frequent, continuous, and flexible [29]. It creates the emotional communication scenes necessary to control disease and maintain health, provide social and rehabilitation practical assistance, and supplement and enhance other health care services [30]. Peer support's four core functions are: providing help in daily management, providing social and emotional support, establishing connections with clinical care and community resources, providing active, flexible, and continuous long-term follow-up observation [31].

Standard intervention modes for peer support are mainly from three directions. First, professional medical staffs work as peer supporters, they encourage and guide peer group interactions between patients; Second, peer supporters interact with patients one-on-one through (mobile) phones or the Internet; Third, non-professional community volunteers provide extra support.

The specific peer support contents are:
1. Daily supervision: intake of drugs, balanced diet, rehabilitation exercise, emotional management, etc.
2. Psychological and emotional support: family caregivers and other stakeholders encourage patients to use stress-relief techniques, increase companionship, verbal comfort, encouragement, etc.
3. Instant communication: seek professional medical staff's assistance regularly, including monitoring patients for regular check-ups, Q&A online, and give feedback on rehabilitation data, etc. [32].

The impact of disease management on individuals lasts a lifetime, so it is imperative to be proactive and flexibly use continuous support.

2.2 Benefits of peer support

2.2.1 The theoretical framework of peer support
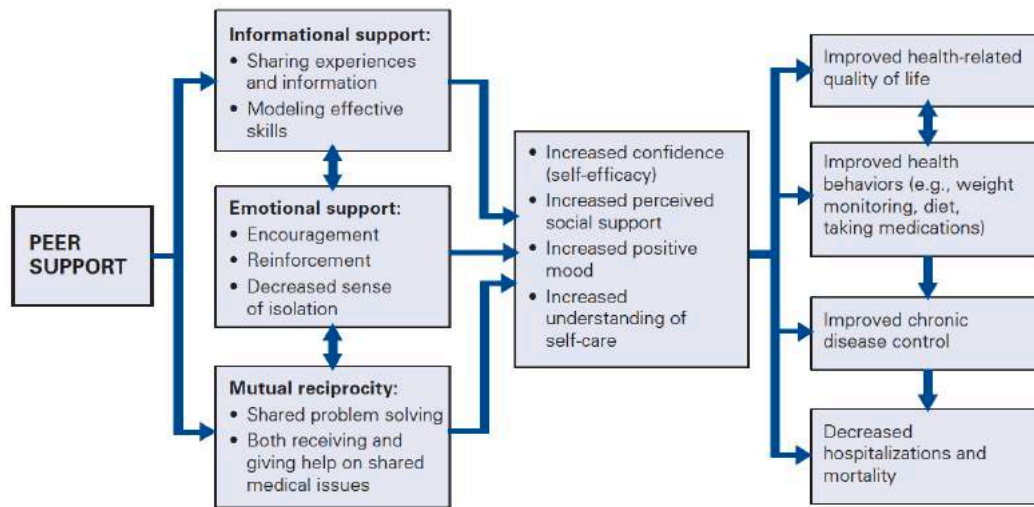
Figure 2.1 How Peer Support Can Improve Chronic Disease Outcomes
Source: Michele Heisler, M.. 2006

The figure above summarizes how peer support can help patients control chronic diseases and improve their health. Peer support's effectiveness is that patients share experience and rehabilitation knowledge with people with similar experiences, and the establishment of dialogue is based on the equal status of both parties [33]. The more homogeneous the peers are (for example, sharing similar life experiences and ages), the more likely this support will lead to understanding, empathy, and mutual assistance. Group therapy is an integral part of improving drug abuse and resolving negative emotions, and reach a long-term agreement with the positive psychological guidance needed by patients with chronic diseases. Therefore, the peer support mechanism is different from professional clinical nursing services and complementary to the traditional treatment.

Besides, peer support between patients with the same chronic health problems can be combined with external social support. The lack of practical social support will increase patients' recurrence rate and mortality, it indicates that patients will continue to be unable to get rid of psychological distress and depression, and reduce work efficiency. On the contrary, obtaining social support increases the patient's motivation for life expectancy, self-efficacy, medication adherence, and improves self-reported health conditions. Peer support therapy combined with social support reduces patients' loneliness, assists in the implementation of medical care programs fully, and improves the quality of patient self-management at the meantime.

A growing body of evidence shows that peer support providers may receive even more positive support than patients and generate health benefits. People who provide social support through voluntary activities have adjusted their essential health and socio-economic

conditions to reduce symptoms of depression, increase self-esteem and self-efficacy, and improve their quality of life.

By training and mobilizing volunteers or staffs who are not healthcare professionals, peer support interventions have significantly reduced the resource-intensive traditional case management model. The peer support model can produce greater effectiveness in areas facing public medical resources restrictions.

2.2.2 The scientific evidence of peer support

In Western developed countries, peer support theory has been applied early, and there are significant clinical success cases. The use of peer support interventions in the Robert Wood Johnson Foundation's self-management program has resulted in many benefits, including significant progress in patient blood sugar control [34]. In Denver, the United States, peer supporters helped community residents in need to make more use of community medical and specialty care services, successfully transferred costs, reduced the utilization rate of emergency, inpatient care, and outpatient services, and made a 2.28:1.00 investment return [35]. In St. Louis, the United States, peer support intervention was used to help a group of mothers of children hospitalized with asthma covered by the public medical assistance system. In two years, they successfully reduced asthma's readmission rate by 50% among those children [36]. Several randomized clinical trials in Pakistan have found that peer supporters (community healthcare workers) implement education as a family unit, combined with the once-a-year training of primary medical staff, to help hypertensive patients improve blood pressure control effectively. Cognitive-behavioral therapy for postpartum women can reduce the symptoms of postpartum depression by 50% [37].

In China, peer support started late and began to be mainly used in the field of youth education and psychological counseling. It has a positive impact on academic performance by influencing students' self-efficacy, self-esteem, and self-confidence. With the upgrading of medical services, peer support extends from the spiritual field to clinical treatment and gradually applies to the rehabilitation management of chronic diseases such as tumors, cardiovascular and cerebrovascular diseases, and diabetes [38]. The Community Health Service Center in Ruijin 2nd Road, Huangpu District, Shanghai grouped 200 patients with type 2 diabetes into a 9-month controlled trial. Each group was led to the meeting rooms and service centers of the community under the peer group leader's leadership. Members perform peer support activities. The test data concludes that peer support can effectively improve the self-management ability of diabetic patients in the community [39]. Tongji Medical College of Huazhong University of Science and Technology conducted group experiments on 94 patients with prostate cancer after surgery. Community doctors and nurses conducted regular house visits and arrange patient group activities, and they did telephone follow-up communication with patients and their family caregivers [40]. According to data evaluation, they found that peer support education can improve patients' sense of self-efficiency, the quality of life, and the social support status.

2.3 The application trend of peer support

With the popularization of Internet technology, peer support creates a combination of online and offline to connect various scenes of patients' lives, and the form of activity organization is more flexible and diverse. According to the patient's different postoperative rehabilitation stages and the existing peer support resources, the medical care team or relevant social organizations will formulate the most scientific peer support schedule.

The Minato Ward Health Sciences Research Institute in Tokyo, Japan, conducted an exploratory, descriptive, cross-sectional, web-based survey of members of four Japanese online breast cancer communities. The institute asked patients about social demographics, disease-related characteristics, mental health, participation in online communities, and peer support received from these communities. The result shows that patients who post more to the community get more benefits than the lurkers, including emotional support, effectively helping other patients, and expressing their emotions[41]. In a 2017 study on the discovery of peer support advantages of breast cancer patients at the Peking Union Medical College Hospital of the Chinese Academy of Medical Sciences, the experiment was in the form of Pink Garden volunteers organized by the hospital in the breast surgery ward twice a week. In the second visit, most of the positive psychological indicators of the experimental group of patients have improved [42]. Xuzhou Cancer Hospital in Jiangsu Province conducted a controlled experiment on 86 patients with modified radical mastectomy for breast cancer. Based on the principle of joint selection, the use of case sharing, motivational interviews, knowledge lectures, community activities, fitness, and entertainment, etc., was conducted by peers. Medical staffs supported the education team to establish WeChat and QQ groups, in order to push rehabilitation information in online groups daily, and encourage patients and peers to share their rehabilitation experience. The final evaluation is based on the data of patients' rehabilitation exercise and self-management, and suggestions for improvement are given to patients who have not completed the goal [43]. From 2014 to 2015, the Affiliated Tumor Hospital of Guangzhou Medical University observed 50 patients based on routine care in conjunction with peer education on the WeChat platform for continuous intervention for six months. 50 patients in the control group were given routine continuing care, and they shared positive news in their lives by multi-medias so that they could maintain a positive recovery state. In conclusion, patients receive peer education by WeChat platform can improve the quality of life, hope, and happiness significantly after surgery [44].

The Internet peer support model, has been widely used nowadays. In addition to breaking the boundaries of geographic location, online communication is more efficient and instant. It also reduces the psychological burden and social fear of patients with physical defects due to non-face-to-face communication. As a result, the Internet peer support model will become an increasingly important channel of peer support.

Chapter 3 The Implementation of Peer Support Services in Two Cities

3.1 The peer support implementation in different social contexts

3.1.1 Comparison of social contexts of the two cities

(1) Social welfare

Table 3.1 Comparison of social welfare between Italy and China

	ITALY VS CHINA	
SOCIAL PENSION INSURANCE	Anyone who holds a permanent residence card and has lived in Italy for 10 years, males over 65 years old and females over 60 years old, can receive a pension of 550 Euro/month, regardless of whether they have previously paid taxes or not. Over the age of 65, if they have worked and paid taxes for 20 consecutive years, they will receive a specific pension according to the tax ratio.	There are three main parts: urban employee endowment insurance, government public institutions endowment insurance, and rural endowment insurance. Due to China's pension insurance system's complicated development history, it is difficult to describe briefly. The overall feature is a payment mechanism with low investment and low return.
MINIMUM LIVING GUARANTEE	The minimum unemployment benefit is 890 Euro/month, which is about 10,000 Euros in a year.	It is determined following the local expenses necessary to maintain resident's and villagers' basic living and is approved by relevant departments. There is no uniform standard.
STATUTORY VACATION	14 days in a year	11 days in a year
EDUCATION	Eight-year compulsory education, except for a few private schools, is more expensive, public schools are exempt from tuition, collective schools have religious groups and government subsidies, and the fees are low.	Nine-year compulsory education, except for a few more expensive private schools, public schools are exempt from tuition, but they still need to pay tuition and miscellaneous fees.

It can be seen from the above table that, except for the medical security system, there is a significant gap in social welfare between the two countries in terms of social pension insurance, minimum living security, and statutory vacations. In comparison, the welfare level of the two countries is equivalent in terms of education. Italy's welfare laws are simple and straightforward in a unified manner, based on the fact that the average income of citizens across the country is high, while the regional development difference is small. China's urban and rural development gap is enormous, and the gap between the rich and the poor is

noticeable, so the social welfare laws are complex and adapt to local conditions. In addition to the fundamental differences in the ideologies of the two countries, the government policy, the population base, the size of the country, and the national culture are also essential factors that cause the differences.

(2) Community and family structure

The traditional form of family organization in Italy is patriarchal family-style. The development of cities, industry and commerce makes the family structure develop in the direction of "coreization". The family organization in the transition from the middle ages to modern Italy took the form of a reciprocal, mutual understanding and concord family organization. The families of the related ethnic groups were independent and coordinated to a certain extent, maintaining close contact with non-blood neighbors and friends. Due to Italy's turbulent history of national unification, Italians value the emotional connections between people from the same region or hometown more than they obey Rome's orders. Based on this characteristic, Italy's natural community culture brings traffic, attention, and participation to the organization of various community activities [45].

China's implementation of the one-child policy for more than 20 years has become the main reason for the significant increase in couples' nuclear family (family consisting of only two couples). The social and demographic development defects have gradually become prominent, single-person families have been increasing, young people's late marriages and the life expectancy of the elderly have increased. The growth rate of an inter-generational direct family (more than three generations of direct family lacking the middle generation) has the highest growth rate, reflecting the defects in Chinese society's transformation stage [46]. Neighborhood communication in urban communities in China has been at a relatively low level since the housing marketization. In recent years, different communities in developed urban areas have begun to build good-neighborly central community outlets and raise the level of street-neighbor relations through community activities.

To sum up, Italian community activities use spontaneous relationship bonds as peer support to establish a foundation of ideology, culture, and interpersonal networks. At the same time, China's urban and rural development characteristics and the one-child policy have affected most family communities' composition, making the implementation of peer support more difficult.

(3) Smart medical market development

The global smart medical market is mainly concentrated in the United States, Europe, Japan, and China, while the production is mainly assembled in the United States, Europe, and Japan. In 2015, the sales of smart medical equipment in 11 Western European countries, including Germany, France, the United Kingdom, Italy, and Spain, were approximately US$50 billion, an increase of about 10%. The smart medical market will continue to expand due to the aging problems, the influx of immigrants, and the updating of medical equipment systems. The Italian smart medical market ranks fourth in the EU[47].

Comparing the smart medical industry structure of Italy and China, the export value of smart medical products in Italy is much higher than the import value, and it is listed as the two largest exporters of medical equipment in Europe alongside Germany. The Chinese smart medical industry has continued to develop in recent years, and the market scale has rapidly expanded accordingly. It has become the world's third-largest smart medical market after the United States and Japan. Since 2012, the Chinese import and export trade surplus has remained at around US$2 billion, mainly because the country exports a large number of low-end smart medical equipment to developing countries every year. In 2015, the sales of the Chinese smart medical market were US$25.99 billion, a year-on-year increase of 35.5%, accounting for 10.5% of the global market [48]. It can be seen that in the field of smart medical care, compared with Italy, china has enormous market potential, but the level of technological manufacturing is low level.

(4) Internet penetration

According to the latest statistics of the "2018 Digital Report", as of January 2018, the number of global Internet users has exceeded 4 billion, and it has increased by nearly 200 million in just one year. The Internet penetration rate in Europe and North America is high from the specific data, while Asia's penetration rate is balanced. The African continent has a low Internet penetration rate due to weak infrastructure. The "World Internet Development Report 2018" obtained the scores of the Internet Development Index of 45 countries by assigning scores to various indicators, in which China ranked second, and Italy ranked outside the 20th[49].

Internet applications have different performances in different regions. European countries have a high investment in government interconnection applications. Countries such as Denmark, Finland, Norway, Estonia, France, and the United Kingdom are at the forefront of online services and participation in e-political activities. China, Indonesia, Thailand, Malaysia, and other Asian developing countries and South American developing countries such as Brazil and Argentina are more active in personal applications. The frequency and intensity of social media users are significantly higher than other countries and regions, reflecting people's use in different regions inertial difference[50].

As far as the current development trend is concerned, China's Internet development and penetration rate are higher than Italy's, and the application levels of the two countries are different.

3.1.2 The essential social factors supporting peer support

The development and popularity of the Internet industry have affected the realization of peer support. According to the case of the current situation of interventional breast cancer diagnosis, treatment, and rehabilitation services in Chapter 1, service design, most of the existing breast cancer rehabilitation activities in Milan are offline activities; due to the mature development of China's application industry, online peers in Shanghai support Rehabilitation innovation will have more room for development.

Family organizational structure and family values affect the frequency and effectiveness of communication supported by peers. Most Milan patients live in different places from their families, sometimes community peer support are more comfortable to achieve. However, the characteristics of the interpersonal connection between different families are varies. In Shanghai, it is also ubiquitous for patients and their children to live apart. The parent-child relationship of direct families between generations reduces the effectiveness and density of peer support.

3.2 The impact of differences in medical systems between two cities

3.2.1 Comparison of two medical systems

The well-known medical journal "The Lancet" released the 2019 global medical quality list, which covers 195 countries and regions worldwide, and calculated the specific medical quality and access (HAQ) index for 32 evaluation indicators which Italy ranked ninth, and China ranks 48th. It can be seen that there is a clear disparity in the level of medical development between two countries.

(1) Input of medical resources
In 2014, the Global Public Welfare Foundation's International Health Care System Overview listed the medical systems in 19 countries. The author selected the indicators related to peer support in Italy and China after cancer surgery and listed the following table for comparison. As shown in the table below, Italy's medical system is mature, with adequate resources per capita and an excellent social environment for long-term peer support. In contrast, China lacks effective policies and measures for chronic disease management, and postoperative patients and their families have to bear substantial economic pressure.

Table 3.2 Comparison of Italian and Chinese medical systems (Global Public Welfare Fund)

	ITALY VS CHINA	
FEE POLICY	The Italian medical system declares that all Italian citizens enjoy free medical care throughout their lives. Even unidentified residents can receive humanitarian treatment (such as church hospitals) provide essential free medical services.	Chinese citizens receive different reimbursement proportions based on urban employment, urban residents, and rural residents with three necessary medical insurances. According to the policy, inpatient and outpatient care (including prescription drugs) are paid at their own expense.
PER CAPITA HEALTH CARE EXPENDITURE IN 2014	$3,207	$420
NUMBER OF PRACTICING PHYSICIANS PER THOUSAND POPULATION IN 2014	3.9	1.9

LONG-TERM CARE AND SOCIAL SUPPORT	Patients receive treatment through hospitalization (approximately 180,000 beds in 2012) or semi-hospitalization (14,000 beds) or home care (approximately 634,000 cases). Inpatient services provide rehabilitation services such as nurses, physicians, and dedicated nursing care. The cost of inpatient services depends on the patient's income.	Long-term care is mainly provided by family members at home, with formal long-term care providers being a minority. Family caregivers are not entitled to financial support or tax incentives, and there is almost no long-term care insurance; long-term care institutions pay almost all of their care expenses.
FAMILY DOCTOR	Citizens with a medical card can choose and change family doctors on their own. On average, there are 2 to 3 general practitioners for every 1,000 people, and the upper limit of the number of people served by each family doctor is 1,500.	Villages, community health centers, and private clinics provide medical care services equivalent to family doctors, but the quality varies, and most patients choose large hospitals.
POLICIES RELATED TO CHRONIC DISEASE MANAGEMENT	Expenses are waived, especially for the elderly/low-income groups. In addition to inpatient care, the family doctor will continue to provide related services after the patient is discharged from the hospital.	The government encourages the integration of long-term care and medical services. Township or community hospitals in some areas share the pressure of public hospitals and pay for themselves.

(2) Organizational structure and government role

Organization of the Health System in Italy
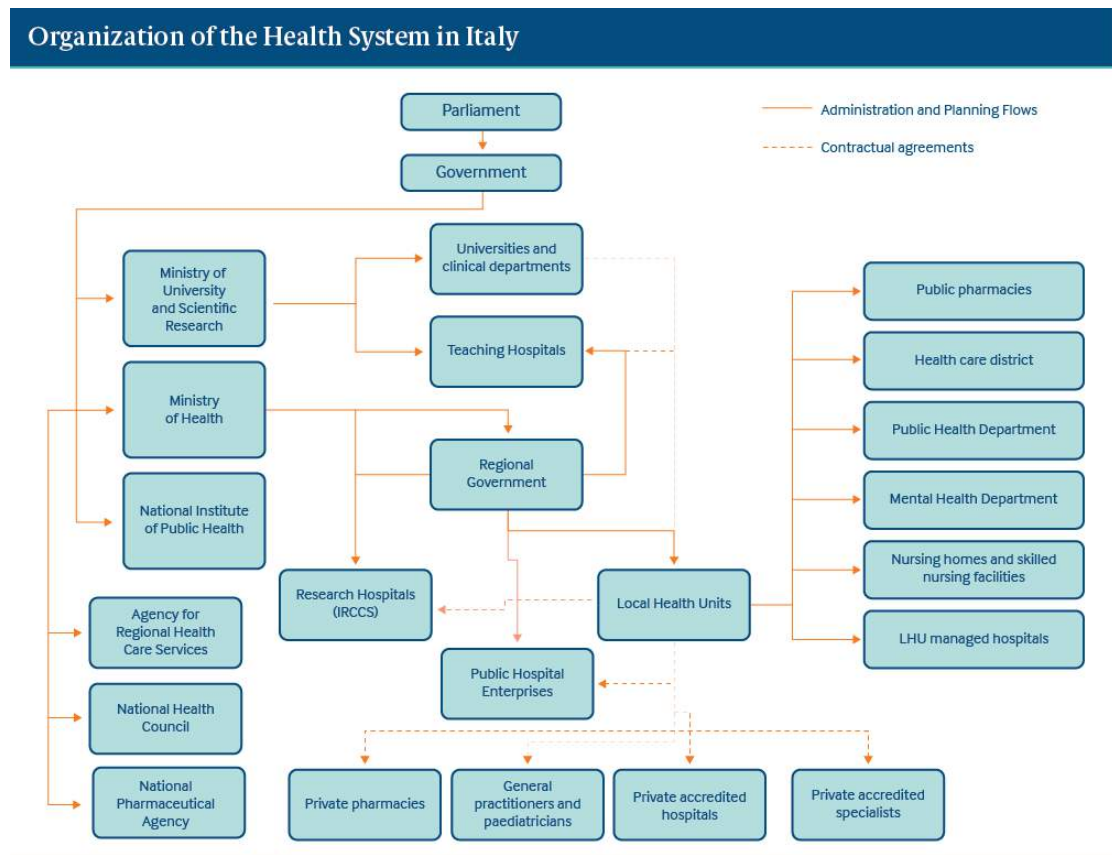
Source: A. Donatini, Emilia-Romagna Regional Health Authority, 2014.

Figure 3.1 The medical system of Italy
Source: A, Donatini, Emilia‑Romagna Regional Health Authority, 2014.

Organization of the Health System in China

China People's Congress

Central Committee of Communist Party of China

State Council

Ministry of Human Resources and Social Security

National Development and Reform Commission

National Health and Family Planning Commission

China Food and Drug Administration

Ministry of Finance

Ministry of Education

Urban Employment-based Health Insurance and Urban Resident Health Insurance

General Administration of Quality Supervision, Inspection, and Quarantine

National Universities

State Administration of Traditional Chinese Medicine

Rural Newly Cooperative Medical Scheme

Hospitals

Hospitals

Provincial Governments

Chinese Academy of Medical Science

China CDC

Bureau of Health Politics and Hospital Administration

A similar government structure to that at the national level

Department of Health Care Quality

Figure 3.2 The medical system of China
Source: Hai Fang, Peking University, 2015.

According to the organization chart of the medical system of China and Italy published by the Global Public Welfare Foundation in 2014, there are obvious differences in the two countries' organization. Italy is led by parliament and government, and there are clinical research institutions from all levels. Governments at both the national and regional levels are responsible for maintaining service quality, and various departments monitor and cooperate and intervene promptly. Besides, Italian medical-related legislation is completed, there is clear guidance for the diagnosis and treatment of various diseases, the local medical system is well-developed with vital peer support resources. It can form a benign closed loop of information after evaluating the quality of services from the hospital to the community. The government

mainly plays a coordinating and promoting role in the entire system.

With the State Council as the core leadership, China has formed a top-down, one-way leadership structure. Each national supervisory department is in charge of medical institutions at all levels, each management branch is relatively independent, local medical development is weak. There is a lack of service quality assessment departments. In addition, medical-related legislation is still in its infancy, and most peer support services rely on the extended care of public medical institutions. Given the characteristics of the government's centralized management and its leadership role, when the government increases the resource input of peer support, it will have a direct and hugely positive impact on service quality.

3.2.2 Insights from preliminary infield research

(1) Preliminary investigation of peer support after breast cancer surgery in Milan

Based on the basic understanding of the desktop survey of the Italian medical system architecture, the author visited different types of medical institutions in a targeted manner to gain an in-depth understanding of breast cancer diagnosis and treatment and peer support related services under the medical system of Lombardy region, where Milan is located. The following table lists the information of the research process:

Table 3.3 Preliminary investigation in Milan, Italy

Institution name	Mangiagalli Hospital	IEO CENTRO	IRCCS Foundation National Cancer Institute	Salute Donna
Institution nature	public hospital	private hospital	National Cancer Institute	NGO
Research time	2019/2/8 2:00pm-3:40pm	2019/2/8 9:30am-11:30am	2019/2/18 2:00pm-4:00pm	2019/2/20 10:30am-12:30am
Research method	Observation method, shadow plan	Observation method, shadow plan, random interview	Observation method, shadow plan	Observation method, structured interview
Interviewee	/	2 help desk staff 1 patient in the waiting area	/	Office Administration Director
Research purpose	Understand the service process related to breast cancer, observe service contacts, and follow the public peer support services.	Understand the service process related to breast cancer, observe the action routes and touchpoints of the target group, collect patient evaluations, and understand the service quality related to peer support.	Discover the advantages of the experimental services , and know more about the cutting-edge service models.	Understand the operation model of the NGO, experience the rehabilitation courses provided, and find out the specific peer support forms.

(1) Mangiagalli Hospital:

• Institutional background

As the most prestigious and long-established obstetrics and gynecology hospital in Milan, Mangiagalli Hospital focuses on women's fertility and daily health. It does not have an independent tumor and cancer department but has a professional breast cancer specialist. The online appointment system is relatively mature. Residents enjoy free medical services for life. There is a multi-function machine at the entrance of the hospital lobby. Residents are skilled in the machine operation and have an orderly queue. Except for regular outpatient clinics, most patients and their families are concentrated in obstetrics and gynecology.

Figure 3.3 The lobby of Mangiagalli Hospital

Figure 3.4 The comprehensive registration waiting room, and the waiting area outside the breast department

• Regional investigation of breast diagnosis and treatment

The registration waiting room is almost full, there are ten registration windows, the number is turned over quickly, and the service efficiency is high. Compared with the obstetrics and gynecology department, the breast department is relatively remote, and few people waiting for consultation. The woman in the picture on the right does not speak English and browses information about breast cancer diagnosis and treatment alone in the waiting area. Within 40

40

minutes of fixed-point observation in the breast department, a total of 3 medical staff entered and exited, and one patient was waiting for treatment. No publicity information related to peer support was posted near the department, only introductory notices for medical appointments.

• Research summary

As the hospital is a public hospital with a history of more than 100 years, it has a relatively solid mass foundation and is closely integrated with the social welfare network, making it very well-known to residents. Since the breast specialist is not its special department, medical resources and equipment are relatively weak, and there is less targeted information guidance for breast cancer patients. From the official website and field visits, the author learned that the peer support service is over the basis level. Patients are follow-up by phone and email, at the same time, the family doctor also serves as a peer support role to continue to supervise the patient after discharge from the hospital.

(2) IEO CENTRO:

• Institutional background

IEO CENTRO is one of the fastest-growing comprehensive cancer treatment centers in Europe. Its treatment methods and medical services have reached the world's top level. The author investigated the branch of the hospital in the center of Milan, surrounded by residential areas. Due to its private geographical nature, the advanced infrastructure and information guidance system, and the better service attitude and quality, the charges are significantly higher than those of public hospitals.

Figure 3.5 The entrance and digital registration system of IEO CENTRO

• Regional investigation of breast diagnosis and treatment

There are four staffs on duty at the information desk near the main entrance, all of them are middle-aged Italian women, three of whom can use simple English vocabulary. There are two forms of patient numbering, one is permanent for patients who have had medical records for multiple visits, and the other is situational for patients who have to undergone a checkup for the first time. Two different forms calling in the same system, the process is efficient and fluent.

Figure 3.6 The display cabinet in IEO CENTRO

The display cabinet's top layer is for women's breast health products, postoperative rehabilitation guides, and books on postoperative dietary matching. The middle two layers are magnet accessories with health benefits, and the bottom layer is for daily chemicals made of pure natural herbs. On the right shelf of the display case, some paper female health education publications, of which about 30% are related to rehabilitation guidance after breast cancer surgery, and cancer companions support about 10%.

The waiting area corresponds to the consultation room, and translucent screens separate the waiting areas of different departments. In the morning, there are fewer crowds. There are three middle-aged women and one middle-aged man in the waiting area. There is no communication between the patients. Only three of the six consultation rooms have doctors on duty. The environment in the courtyard is tranquil, and the public areas are monitored.
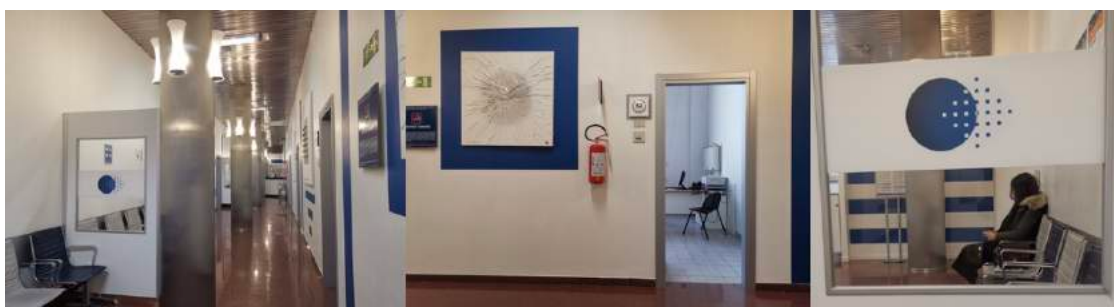
Figure 3.7 The waiting area outside the consultation room in IEO CENTRO

• Research interview
The author conducted unstructured interviews with a patient waiting for treatment and two staff members in the hospital. The waiting patient is a 46-year-old resident in Milan who works as a housewife and speaks a little English. She said that she found discomfort in the left breast and was recommended by a friend for a breast examination. It is believed that the IEO city center is too small to meet the inspection conditions, and she will go to the suburban

headquarters if a further medical treatment is needed. The hospital's internal environment is comfortable, and the number of doctors and nurses on duty and the number of patients is small. The patient said that she did not know about peer support-related services and was still waiting for the medical examination results. The staff said that Saturday was the peak period. The vast majority of patients were women, and nearly half of the patients were accompanied by other family members. Breast, lymph, and ovaries accounted for the majority of scheduled medical examinations. The function of the downtown center was mainly for physical examination and consultation. If the patient's examination report found any abnormality, the patient would be directly contacted and transferred to the headquarters. The downtown center and headquarters shared information on patient registration in the form of digital medical records. According to the staffs' feedback, the inpatient department's ward at the headquarters is not open to the public. The postoperative companion support services that patients received were internal patient sharing sessions and psychological lectures during hospitalization. The hospital would also recommend targeted NGO courses. As a member of the public medical system, family doctors also had the right to know the patient's progress to support the rehabilitation.

• Research summary

The downtown center primary business is the physical examination, which has a broader radiation range than general physical examination centers so that it attracts more urban people. Digital medical records and information synchronization make the transfer cost low, and at the same time, establish the patient's sense of trust in the hospital. The wards of some private hospitals for diagnosis and treatment are not open to the public, and it is challenging to continue to track the peer support activities who have recovered after the operation.

(3) IRCCS Foundation National Cancer Institute:

• Institutional background

The IRCCS Foundation was established in 1928. The institute has been responsible for major national clinical medical projects and has become a reference institution for other cancer research. It is characterized by high-level therapeutic diagnosis, combining clinical practice data with evidence found in the laboratory. The institute is also responsible for training medical staffs and formally carrying out teaching activities through an agreement with the cooperative universities. The flow of people in the institute was relatively sparse, most of which were concentrated in the diagnosis and treatment area.

• Regional investigation of breast diagnosis and treatment

Figure 3.8 The lobby, and diagnosis and treatment area of IRCCS Foundation National Cancer Institute

The navigation in the institute's lobby is distinguished by color, which is straightforward and easy to understand. Near the entrance, the publicity counters of various NGOs cooperating with the institute are displayed, among which Salute Donna and Lilt are the most well-known health promotion non-profit organizations in Milan. All patients treated in the institute are cancer patients, breast cancer accounts for about 25% of them. The breast cancer department covers a relatively large area and a big proportion of medical resources. There is also a section to promote patient activities and peer support in the breast cancer department's waiting area. Overall, the atmosphere is warmer than in other medical institutions.

Figure 3.9 The consultation counter of Salute Donna

The various leaflets on the Salute Donna counter are available for free. The leaflets list recent rehabilitation courses and public welfare activities participation information. The overall promotional materials are displayed and communicated efficiently, and patients can easily reach them. The activities include both a healthy diet course for the general public and peer support rehabilitation courses for breast cancer patients. Both patients and their stakeholders can benefit from the NGO education.

Figure 3.10 The artwork exhibition of Lilt art rehabilitation treatment

Lilt activities are aimed at patients undergoing cancer treatment and postoperative patients, including inpatient, outpatient or follow-up treatment. There are various kinds of activities, from music, art to physical exercises, which meet the needs of patients at different stages, help establish connections between patients and peers.

• Research summary

The comprehensive service provided by the IRCCS Foundation National Cancer Institute connects medical universities, scientific research institutions, and social non-profit organizations. Breast cancer patients receive professional diagnosis and treatment services, and they also obtain resources from the hospital to support the rehabilitation of their peers after discharge. Doctors learn detailed data from non-profit organizations' peer support service arrangements and give professional advices. It reflects the flexibility and diversity of institutional services under the Italian healthcare system. Patient diagnosis, treatment, peer support after discharge, and self-management can be effectively assisted.

(4) Salute Donna:

• Institutional background

The Salute Donna Women's Health Association was established in 1995 with funding from the IRCCS National Cancer Institute Foundation in Milan. In cooperation with the Italian National Cancer Institute and many public hospitals, it's committed to spreading the knowledge of the diagnosis and treatment of tumor diseases, supporting scientific research on the quality of life of cancer patients through social activities, and promoting health education courses in Italy. The interviewee was the office's administrative manager, who was responsible for managing the overall operation and event coordination of the Milan branch. The author was allowed to interview the manager after making an appointment by phone in advance. The interview format was a structured interview and lasted for one hour. The interview details were recorded in Appendix A.

• Research interview

The interviewee has worked in the NGO for 24 years and is mainly responsible for the office's

administrative management, coordinating the operation of various departments, and has a very in-depth understanding of the field of women's healthcare.

Figure 3.11 The manager office of Salute Donna

In the work of daily coordination and communication, interviewees believe that the appointment with doctors is the most difficult before the routine group meeting. The doctors are so busy that it need to be adjusted according to the doctor's schedule. At present, the institution is running well, and the funding channels are mainly composed of three parts: private enterprise funding, social donations, and registration fees for some courses. The organization's business covers the whole country. A new business point is preparing to set up in the southern Sicilia region. Moreover, Salute Donna once held public welfare activities in Serbia. The NGO publishes an annual report, displaying data on cooperation with different organizations and reports on the successful activities.

The Cascina Rosa and Nordic Walking courses are oriented to society and are held three times a month on average through professional teaching. Moira is only open to patients after breast cancer surgery ten times a month, through group communication and yoga to help patients rebuild themselves. Cascina Rosa costs 55 Euros for each class and 165 Euros for three classes. The cost includes the ingredients and utensils provided in the class. Moira, Nordic Walking is totally free. Because the Moira course involves the treatment and privacy of patients, additional participants need to get the doctor's consent in advance. Most of the patients knew about the activities by residents words of mouth. At present, telephone registration is the most common channel, and there is currently no service for foreigners.

Figure 3.12 The Campus Cascina Rosa outdoor teaching area

Curriculum efficacy evaluation is mainly based on patient questionnaire feedback and doctors' professional assessments. Every quarter, doctors will cite clinical treatment effects through professional psychological evaluation data, quote real feedbacks from patients, and organize them into ppt reports for discussion in internal meetings. The assessment data can also be shared with the patient's family doctor when needed.

Figure 3.13 The manager presents the service evaluation report

Patients participating in peer-supported activities have a process of adaptation. Most participants are able to establish good relationships and become friends in life with mutual understanding. Compared with patients' family members, peers have more familiar topics as the vital role. After breast cancer surgery, the focus of rehabilitation is to overcome fear, patients should always pay attention to the mental health state, cultivate personal hobbies, and stay in a good mood. Listening and companionship are the focus of family peer support, and family doctors guarantee the consolidation of family peer support. NGO courses promote the peer communication with positive development, and the experience sharing after the class can also create more topics.

In Italy, there are many women's health institutions that are paying attention to cancer

patients, and there are also large amount of related short-term activities, but the society as a whole has not formed a unified mechanism, and the government has a less medical investment in women's cancer rehabilitation. Salute Donna's problem is that the activity lifecycle is uncomplete, and it is difficult to provide patients' long-term attraction.

• Research summary

Salute Donna has a mature nationwide operation, with sufficient knowledge, technical support, and financial support. There are various forms of postoperative rehabilitation activities for breast cancer patients, and the innovation is maintained. Participants feedback collection allows organizers improve the service quality. However, due to local language restrictions, some events are not compatible with foreigners.

(2) Preliminary investigation of peer support after breast cancer surgery in Shanghai

Based on the basic understanding of the desktop survey of China's medical system architecture. The author visited different types of medical institutions to gain an in-depth understanding of services related to breast cancer diagnosis and treatment and peer support under the Shanghai medical system, as a comparison with the Milan survey.

Table 3.4 The preliminary survey in Shanghai, China

Institution name	Ruijin Hospital Affiliated to Shanghai Jiaotong University	Shanghai Fudan University Affiliated Tumor Hospital	Shanghai Yangpu District Central Hospital	Tongji University Affiliated Breast Cancer Psychological Quality Education Research Association
Institutional nature	Tertiary Class A Public Hospital	Tertiary Class A Cancer Hospital	Public hospitals	Affiliated Institution of Tongji University Hospital
Research time	2020/02		2019/11/29 11:30am-14:30pm	2019/10/21 12:30pm-15:30pm
Research method	Desktop research, online platform data collection		Observation method, shadow plan, structured interview	Observation method, random interview
Interviewees	/		1 breast surgeon and 1 clinical intern	2 participants
Research purpose	Understand the service process under the top three public medical systems, observe and collect specific evaluations of postoperative rehabilitation services on various medical platforms, and understand the limitation of peer support services.		Understand the service process in regional public hospitals, observe the action route and service contacts of the target group, and learn about peer support implementation through interviews with medical staff	Experience the rehabilitation lectures provided by the seminar, and learn about the teaching methods of peer support.

(1) Ruijin Hospital Affiliated to Shanghai Jiaotong University:

• Institutional background
The Department of Breast Surgery, Ruijin Hospital Affiliated to Shanghai Jiaotong University School of Medicine was established in February 2009. The department is based on Ruijin Hospital, Affiliated with Shanghai Jiaotong University School of Medicine. It is a comprehensive integration of multidisciplinary groups into a breast disease diagnosis and treatment center dedicated to preventing, diagnosing, and treating breast diseases: medical, teaching, and scientific research institutions.

• Regional investigation of breast diagnosis and treatment
The Breast Surgery Department of Ruijin Hospital is located on the 22nd floor of Building No. 1 of the hospital. It integrates the outpatient department, ward department, and diagnosis department and provides patients with an excellent medical environment based on convenient "one-stop service". The department's outpatient department has a breast disease clinic, expert clinic, special disease outpatient clinic, general clinic, multidisciplinary consultation for difficult breast cases, and outpatient chemotherapy and rehydration area. The ward department has a breast surgery ward, breast radiotherapy, and chemotherapy ward, and ICU. The department is also equipped with an internationally advanced digital molybdenum target, B-ultrasound, stereo X-ray positioning system, and the only domestic breast dedicated magnetic resonance imaging instruments provide patients with convenient and efficient services.

Figure 3.14 Hospital environment
Source: Dianping App

As of February 2020, there were 2029 comments on the Dianping platform (life consumption recommendation and reviews), 1,012 positive comments, 339 moderate comments, and 526 negative comments. The praise is generally on four points: 1.the authority of the Jiaotong University; 2.the professionalism of doctors' diagnosis; 3.the convenience of online appointments; 4.the spaciousness and cleanness of the environment. The negative reviews come from the long waiting time during peak periods and the unreasonable re-checking step of picking medicines.

• Online appointment medical service

Figure 3.15 Breast clinic appointment registration process
Source: The official WeChat service of Ruijin Hospital

In addition to the official platform, Good Doctor, Mingyihui, 39 Medical Assistants, and WeDoctor registration network all have breast outpatient registration channels, in which doctor information is open and transparent. The online consultation and evaluation system of these platforms is complete different. The other demonstration hospitals focus on efficiency in their outpatient services and development to optimize processes in the face of colossal outpatient needs.

The Haodafu online platform reflects a more comprehensive online and offline service for breast cancer departments. The main sections include the department homepage, expert list/outpatient time, doctor consultation, consultation history, expert recommendation, and post-diagnosis service. Among them, the content of patients in the consultation section focuses on the difficulties before diagnosis and treatment and does not involve postoperative rehabilitation service. The post-diagnosis service page is empty, reflecting the lack of services in the hospital's postoperative rehabilitation follow-up and the low investment in postoperative consultation on the third-party medical platform.

• Research summary
Due to the advanced technology and equipment of breast surgery in the hospital, the high level of physician qualifications, and the massive demand for patient consultation, the attention and discharge tracking services that individual patients can receive are minimal. This is a common problem in China's top three hospitals. To solve efficiency, the hospital has made improvements in online appointments and consultations, but it is challenging to consider the patient's condition tracking after discharge when improving efficiency, and it has not developed peer support-related services.

(2) Shanghai Fudan University Affiliated Tumor Hospital:

• Institutional background

Since 1952, Professor Li Yueyun, one of the founders of Fudan University Cancer Hospital (formerly Shanghai Cancer Hospital), initiated breast cancer treatment in China, more than 7000 breast cancer cases have been operated on so far, and the 10-year survival rate after breast cancer stage I and II are 88% and 78% respectively, reaching the advanced international level. The hospital currently has 3 wards, 159 standard beds, and 18-day surgery beds. There are 24 clinicians, 4 doctoral supervisors, 3 master supervisors, and successively trained 4 post-doctoral fellows, 34 doctoral candidates, and 38 master's degree supervisors. In the last 5 years, 10-15 breast cancer specialists have been recruited each year, and several breast cancer forums and breast reconstruction workshops have been held consecutively.

The Shanghai Breast Cancer Clinical Medicine Center will continue to take the road of basic scientific research with clinical practice. As a critical clinical scientific research base of the Ministry of Health and Shanghai, breast surgery has undertaken several scientific research projects at or above the provincial and ministerial levels, including the National Natural Science Foundation of China, the Tenth Five-Year Research Fund, and the Ministry of Health Research Fund. The combination of cancer research and clinical practice is different from that of the Ruijin Hospital affiliated to Shanghai Jiaotong University School of Medicine, which focuses on clinical diagnosis and treatment. At the same time, it is very similar to the IRCCS Foundation National Cancer Institute in Milan.

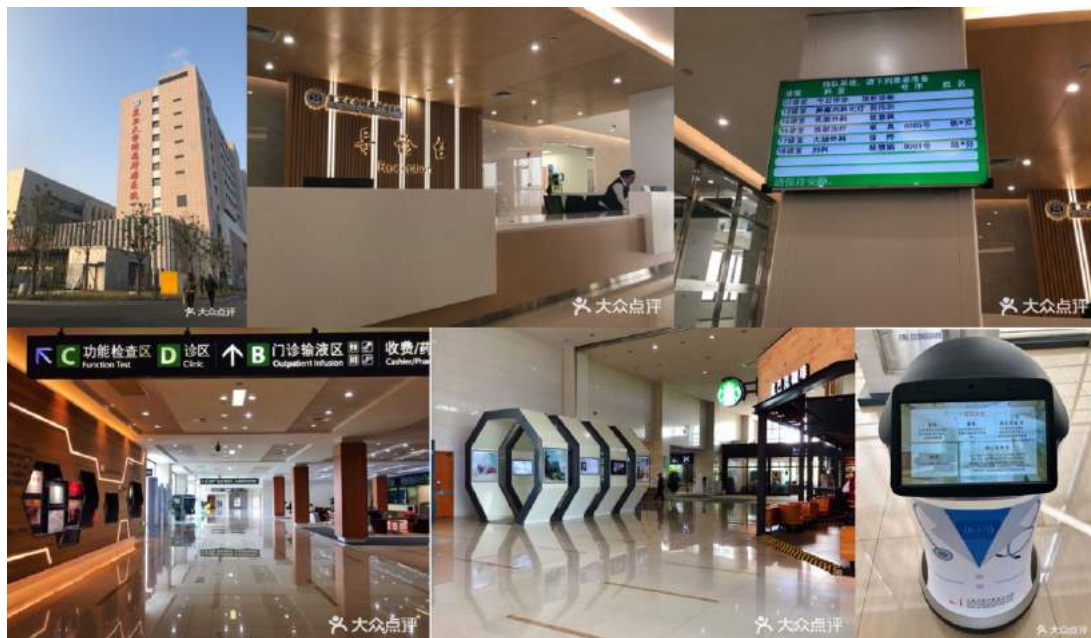• Regional investigation of breast diagnosis and treatment

Figure 3.16 The environment of the new campus built in 2014
Source: Dianping App

As of February 2020, there are 43 reviews on the public comment platform, 36 good reviews, 1 moderate review, and 6 negative reviews. Because the hospital has a new campus in 2014,

the number of reviews is small, and the praise content is consistent with the hospital's high-tech, smart application and advanced environmental equipment. Bad reviews are related to high charges and insufficient doctor resources.

• Online appointment medical service

Figure 3.17 The clinic appointment registration process
Source: The official WeChat service of Shanghai Fudan University Cancer Hospital

The nature of its oncology department determines the department structure to be more refined. In addition to official registration, Good Doctor Online, Mingyihui, 39 Medical Assistants also have the portal to register for consultation. Combined with the relevant comments of online platform. Users may gain information about hospital's online appointment, call number, diagnosis results, and treatment arrangement by these efficient technical means. The development of the hospital's scientific research projects also depends on the accumulation of clinical data. At the 12th Shanghai International Breast Cancer Forum and the 2nd Shanghai Breast Cancer Rehabilitation Forum, the hospital released the "rehabilitation bracelet" smart product. Patients after breast cancer wear the smart bracelet can achieve remote monitoring with doctors' help undertake professional postoperative health management to prolong survival. The "smart bracelet" collects real-time data on patients' movement and sleep and feeds the data back to the hospital platform. The doctor will evaluate the patient's quality of life, body composition, body fat muscle, exercise status, etc., and form a personal evaluation profile. The profile can be formed as soon as in 3 months, and long-term monitoring and analysis can also be carried out.

Figure 3.18 Breast cancer rehabilitation smart bracelet
Source: Sina News

The hospital has also established an official WeChat platform, "Yankang e Follow-up". Healthy people or patients receiving treatment or even postoperative breast cancer patients can complete preliminary screening, diagnosis, and establish communication with experts through this platform to facilitate postoperative chemotherapy, endocrine therapy and follow-up treatment, etc. [51]. At present, nearly 20,000 people have been included in this service platform, and 80% of the patients come from cancer hospitals. The medical assistance section of the platform provides follow-up medical examination appointment service and postoperative management news in the science column section.

Figure 3.19 The Yankang follow-up treatment registration process
Source: The official WeChat e-service of Yankang

Yankang Garden feature is mainly for the postoperative rehabilitation salon offline event information release and the review of successful events. From the official information announcement, it is known that the frequency of the salon and related activities is about once every two months, and the participants are mainly clinical experts from the breast department, volunteers, and patients after breast cancer surgery. The salon is mainly taught by medical experts, while the activity forms are various, including painting, dancing, gymnastics, hospital

bed visits, etc. The salon and related activities have been organized in 2018 and have attracted a certain amount of social attention.

Figure 3.20 The WeChat platform "Yankang Garden"
Source: The official WeChat e-service of Yankang

Figure 3.21 Xiaoyan speaker
Source: Tencent News

Xiaoyan Speaker is a new generation of intelligent assistants developed by AstraZeneca China and Tmall jointly, which initiated by the hospital's breast surgery department in 2019. The development of the Xiaoyan speaker is perfectly integrated with its two core functions. By calling on Xiaoyan speaker, patients can easily evoke the two service modules of disease question and answer and rehabilitation video in Yankang e follow-up. The voice interaction makes the follow-up experience not limited to graphic information interaction, making breast cancer rehabilitation and follow-up more convenient and practical.

• Research summary

Compared with the IRCCS Foundation National Cancer Institute in Milan, the hospital has a more advanced equipment environment with a different focus on postoperative services. The IRCCS Foundation National Cancer Institute provides patients with different offline rehabilitation institutions registration channels and offline activities. Fudan University Cancer Hospital established an online platform for patients' follow-up in the hospital's breast department. Patients in Shanghai registered online to participate in activities, reflecting the fundamental difference between the two places where patients receive rehabilitation services after surgery.

(3) Shanghai Yangpu District Central Hospital:

• Institutional background

Shanghai Yangpu District Central Hospital (Yangpu Hospital Affiliated to Tongji University) consists of 4 hospitals. It was founded in 1948 and is a tertiary and B-level comprehensive hospital. The Department of Breast Surgery, Yangpu District Central Hospital, was established in February 1990 and is one of Shanghai's earliest breast specialists. At the beginning of its establishment, there were 17 beds. After years of department construction and development, there are currently 28 breast surgery beds, with more than 15,000 outpatient visits per year and about 900 discharged patients. There are 8 specialist physicians in the department, including 1 chief physician, 2 associate chief physicians, 4 attending physicians, and 1 resident physician.

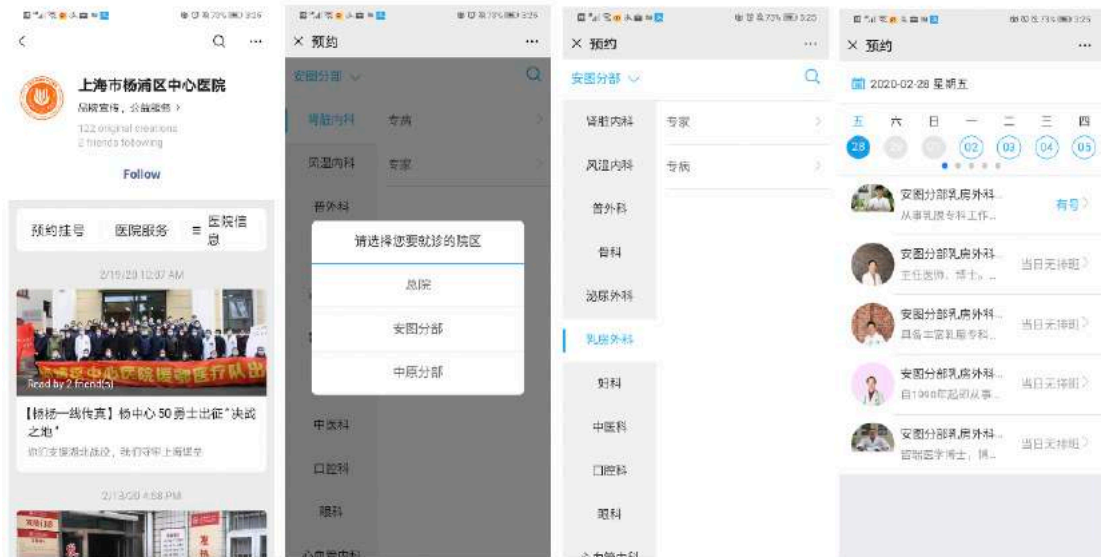• Online appointment medical service

Figure 3.22 The clinic appointment registration process
Source: The official WeChat service of Shanghai Yangpu District Central Hospital

The official appointment registration system is simple to operate, similar to Ruijin Hospital and Fudan University Cancer Hospital's registration process. Since this hospital is a tertiary

hospital, the demand for online consultation is relatively small, and only one breast specialist online consultation service is available.

• Regional investigation of breast diagnosis and treatment

Breast Department is located on the third floor of the hospital. A dense flow of people are concentrated in the physical examination area, while the breast surgery ward is less crowded. The walkway area is empty, and there is a peer interaction board on the walkway wall to enhance the creation of a cozy healing atmosphere.

Figure 3.23 The surgery hospitalization and physical examination area

• Research interview

Figure 3.24 The doctor interview

The author conducted a structured interview with a doctor and an associate physician, and the details of the interview were recorded in Appendix A. Preliminary investigation of peer support after breast cancer surgery. Interviewees said that patients after breast cancer surgery need to undergo long-term regular physical examinations, which are performed every 3 months within 2 years after surgery, every six months for later 3-5 years, and once a year after 5 years. Most patients can make appointments for regular physical examinations online. In addition to physical examinations, patients need to go to the hospital to get endocrine medicines every 3 months, take the endocrine medicines for 5-7 years, and conduct face-to-face consultations according to the doctor's arrangement. Breast cancer is a disease that needs to be observed for more than 5 years. Doctors and patients will establish a relatively long-term relationship. Interviewees said they contacted patients through WeChat or

telephone occasionally, and they had discussions about the meditation condition.

The hospital will remind patients of regular physical examinations and give guidance, but psychological communication needs to be strengthened, especially for targeted counseling based on women's psychological characteristics. The Breast Cancer Mental Quality Education Research Association, affiliated with Tongji, conducts about twice a year theme lectures for patients after breast cancer surgery.

• Research summary

As a regional hospital, the Shanghai Yangpu District Central Hospital has relatively high-quality breast surgery resources. Physical rehabilitation of the side of affected area is concentrated during the hospitalization period. After the patients are discharged from the hospital, the medical team focuses on regular physical examinations, medications, and psychological support. The part of peer support counseling lacks attention, and the form of peer support that patients can reach is unitary.

(4) Breast Cancer Psychological Quality Education Research Association:

• Institutional background

The Breast Cancer Psychological Quality Education Research Association is affiliated with the Hospital of Tongji University and has been established for its fifth anniversary. Two large-scale breast cancer-related knowledge lectures are held regularly each year, with a scale of 80-120 people. The organizer plans the venue of the lecture, and the hospital and social enterprises fund all activities.

• Forms of institutional activities

This lecture's topic is "Bio-Psychosocial Prevention for the Breast Cancer and Women's Positive Mental Actions". The lecture speaker is a national-level breast clinical expert and a clinician from the department of breast care, Shanghai Yangpu District Central Hospital. There were about 80 people. A small part of the participants were breast experts and scholars from different medical institutions, and most of them were patients after breast cancer surgery. The lecture lasted for two hours, during which psychological tests and peer support interactive games were interspersed.

Figure 3.25 The Chief Physician of the Breast Department of Shanghai Yangpu District Central Hospital gave an opening speech

After a brief introduction to the lecture background, another national breast clinical expert began to share the lecture content. The lecture is divided into six sections, namely "Ancient Life Wisdom", "Frontiers in Life Science", "Carcinogenic Psychological Model", "Breast Cancer Factors", "Breast Cancer Prevention Strategies" and "Positive Mind Training".

Figure 3.26 Expert educational lecture

The sharing content initially focused on sharing the international cutting-edge breast cancer rehabilitation treatment with colleagues from the perspective of medical research, and then experts introduced the risk factors of breast cancer, including age, menstruation, fertility, hormones, obesity, Diet, genetics, etc. At the same time, through Eysenck personality analysis, The expert told patients how to stabilize the postoperative rehabilitation effect by changing their personality and mentality after surgery. During the sharing process, the experts invited patients and colleagues to do interactive physical games with brain-hand coordination to mobilize the atmosphere and create a peer support scenario. Then, by giving specific life topics, they guided the patients on-site to do good and active peer support and

communication.

• Research interview

The author interviewed two breast cancer postoperative patients after the lecture, and the details of the interviews are recorded in Appendix A. The two middle-aged female interviewees were both recommended by staffs of medical institutions. They thought that the first half of the lecture was relatively dull, however, they were more interested in the psychological self-regulation of patients, but the content of the explanation lacked the individual patient's situation.

• Research summary

Lectures from the Breast Cancer Psychological Quality Education Research Association are typical in China. Most of the existing peer support service in China rely on the organization of public medical institutions. The content explanation is mainly based on the patient's psychological counseling and the self-management of the affected area. Only a small part involves peer support teaching. Therefore, the participant feedback is generally plain, and it is difficult for participants to maintain enthusiasm.

3.2.3 The main factors influencing of peer support in two cities

Table 3.5 Summary of peer support factors in the two cities

Service Institution	Milan				Shanghai			
	Public		Private		Public			Semi-public
	Mangiagalli Hospital	IRCCS Foundation National Cancer Institute	IEO CENTRO	Salute Donna	Shanghai Fudan University Affiliated Tumor Hospital	Ruijin Hospital Affiliated to Shanghai Jiaotong University School of Medicine	Shanghai Yangpu District Central Hospital	Tongji University Affiliated Hospital Breast Cancer Psychological Quality Education Research Association
Operating Funds	Issued by government public health department and local government		Private	Private and public corporate fundraising, government subsidies	Issued by the financial department of the State Council			Corresponding to public medical institutions and social enterprise fundraising
Service Area	Lombardy	Nationwide			National (Yangtze River Delta region)		Shanghai	
Service Scale	300+ cases/year	600+ cases/year	250+ cases/year	About 480 people/year	1200+ cases/year	1400+ cases/year	900+ cases/year	About 200 people/year
Service Type	Postoperative hospitalization extension			Doctor referral, phone call, email	Postoperative hospitalization, follow-up by official account	Postoperative hospitalization extension		Doctor referral
Participant	medical staffs patients family doctor	medical staffs patients NGO staff family doctor		Patients, family caregivers, community volunteers, rehabilitation experts	medical staffs patients			Patients, volunteers, rehabilitation experts, scholars in related fields

Service Activity	Inpatient rehabilitation exercise guidance, follow-up call and email after discharge	Rehabilitation exercises in the hospital, docking with rehabilitation NGOs after discharge	Patient sharing sessions, psychological lectures, NGO presentations	Various art interest courses, psychological mutual aid groups, participation in community voluntary activities	Rehabilitation exercises in the hospital, follow-up appointments on the official account after discharge, release of offline activity information and open participation	Inpatient rehabilitation exercise guidance, online group after discharge, telephone follow-up	Expert lecture

The shortage of medical resources fundamentally affects patients' willingness to obtain peer support and maintain self-management after surgery. Milan has a small population, and public and private medical institutions with breast cancer postoperative management qualifications are rich in resources and diverse in types. A reasonable ratio of doctors and patients can meet the needs of patients. In comparison, Shanghai has a large population, but a shortage of medical resources, so there is a pursuit of high efficiency in the diagnosis and treatment process. In this situation, online registration appointments and preliminary consultation systems are relatively developed. Due to doctor's and patients' unreasonable ratios, it is difficult for patients to get lasting and long-term attention from doctors during the rehabilitation and follow-up phase after discharge.

The level of NGO development that contributes to women's health and cancer postoperative rehabilitation determines the density and radiation of the peer support network to a certain extent. Mature NGOs integrate the resources of different units such as the government, hospitals, communities, and families to lower the barriers for patients to enter the social circle and maximize the positive effects of peer support. Milan has a large number of comprehensive coverage healthcare NGOs. They are the main organizers of peer support for target groups after breast cancer surgery. The number of relevant NGOs in Shanghai is rare, most of which are affiliated institutions derived from medical institutions in the initial stage of development. Postoperative peer support mainly relies on the original social network and online community connections.

In summary, it can be seen that Milan patients can obtain peer support services from multiple channels. Among them, NGOs' rehabilitation courses have a long-lasting duration, the participation of all stakeholders is high, the content of peer support services is innovative, and there are design opportunities that can be excavated. The postoperative hospital stay in public medical institutions in Shanghai is intense, and the peer support service mainly focuses on the online follow-up of patients after discharge, which is a crucial part of service innovation in Shanghai. Therefore, the subsequent in-depth research will focus on the peer support course services of non-governmental organizations in Milan and the peer support rehabilitation follow-up services of online community in Shanghai.

3.3 Summary of the impact in different medical systems between two cities

From the above content of this chapter, it can be seen that the postoperative rehabilitation services for breast cancer patients in Milan are multi-participated under a complex structure of information fusion. Different information is captured from families, communities, family doctors, hospitals, and NGOs are based on patients' needs. Rely on many well-developed NGOs and community organizations, peer support performs well in various forms of offline activities. Most of the activities are equipped with registered physicians to ensure the quality of peer support activities, and patients can obtain physical, psychological, and quality of life. However, due to offline activities' characteristics, patients need to invest more time and transportation costs, which will undoubtedly increase the burden for patients who are busy in life and work and may cause some patients' loss. After completing the institutional community peer support course, many patients have difficulty maintaining high-quality peer support within the NGO guidance.

In contrast, the postoperative rehabilitation services available to breast cancer patients in China are concentrated during the inpatient observation period. The hospital serves as the center for disseminating information and performing activities to educate caregivers in the patients' families and organize knowledge lectures in conjunction with the community. Due to the development of smart medical care in China and the high penetration of the Internet, most patients can obtain peer support from online communities' communication. However, as an affiliate of a specific medical institution, the existing online community cannot establish a substantial connection with the family and the community, and the peer support resources obtained are relatively limited.

To provide patients with high-quality peer support and is based on a sound social and medical structure, it is also necessary to provide a flexible form of activity that meets the population's characteristics in the region. Compared with Milan, Shanghai patients do not have the conditions to obtain peer support from NGOs and family doctors' perspectives, but they have the advantage of high popularity in the construction of online peer support communities. As long as we make full use of this advantage and open up multiple channels for families, hospitals, and communities, Shanghai patients will also have the opportunity to obtain high-quality and continuous, and stable peer support services.

It can be seen that the differences in the social environment and medical systems of the two places have different factors. The first is the level of development of peer support services of non-governmental organizations, and the second is the application of online peer support communities. In the next chapter, the author will present the results of in-depth research on the peer support course services of an NGO in Milan and the peer support rehabilitation follow-up services (offline/online) of public medical institutions in Shanghai, which will fully show the peer support needs of patients in the two cities.
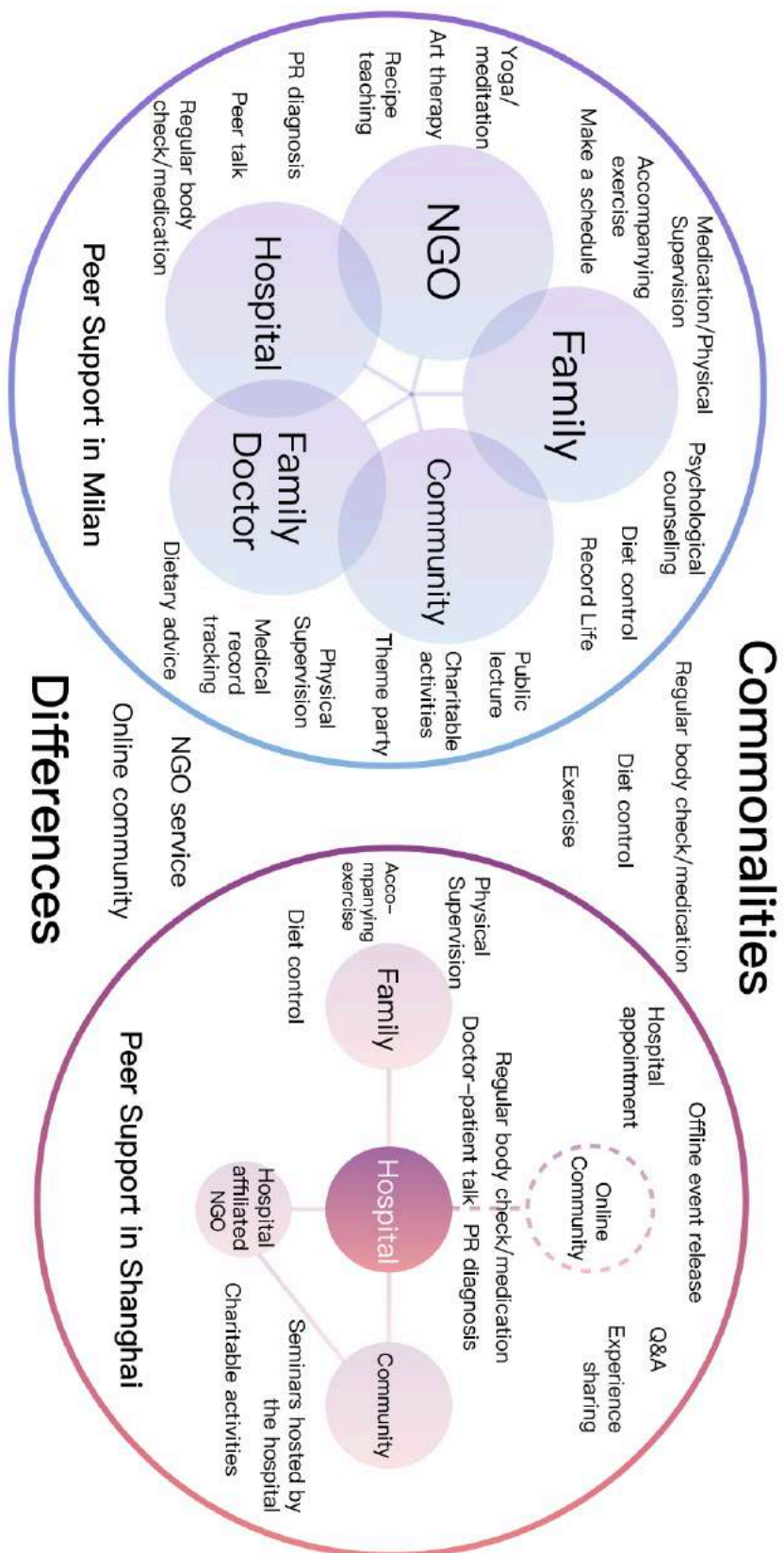
Figure 3.27 The comparison of peer support services between two cities
Source: The author made

Chapter 4 In-depth Research
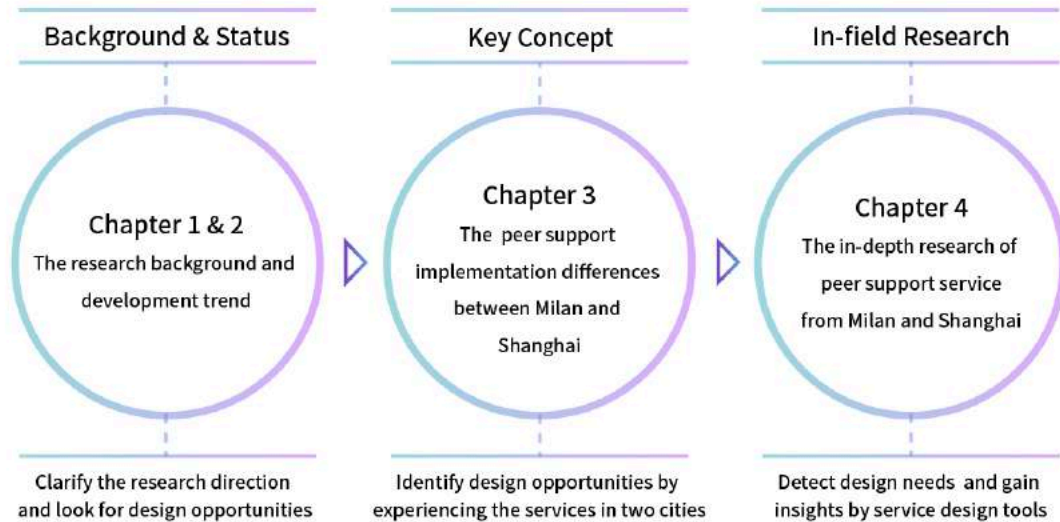
4.1 In-depth Research Purpose

Figure 4.1 The logic diagram of the first four chapters
Source: The author made

Through targeted in-depth interviews with interviewees from different institutions in the two places, immersive experience of the patient's peer support scene, understanding of the real needs and experience pain points of patients of different ages for postoperative rehabilitation. At the same time, do insights of relevant stakeholders from perspectives of family caregivers and medical staffs, obtain comprehensive first-hand materials, and assist in formulating specific design plans in the next step.

The nature of the research institutions and the interviewees' background in the two cities are similar in horizontal comparison. Both of them are institutions that serve urban communities and have a scientific nature. The interviewees both live and work in first-tier cities and have strong capabilities. Majority of them have health and medical knowledge with a high standard of living. After in-depth research, the differences in the specific implementation channels of peer support in the two cities can be clearly identified, and the differences in rehabilitation effects brought by different peer support models in the two places can be compared.

4.2 Research process

Table 4.1 The in-depth research arrangement

Location	Milan	Shanghai
Research institution	Salute Donna teaching area, IRCCS Foundation National Cancer Institute	Shanghai Yangpu Central Hospital
Research time	2019/3/9，2019/4/23	2019/11/29, 2019/12/6
Interviewee	2 middle-aged postoperative patients 1 elderly postoperative patient	3 middle-aged postoperative patients 3 elderly postoperative patients
	2 family caregivers, 1 registered dietitian, 1 psychologist	2 family caregivers
Research output	User journey maps, service system maps	Postoperative experience table, service system maps

As can be seen from the above table, from March to May 2019, the author conducted in-depth research in Milan. Through participating in the Corsi di Cucina cooking class organized by Salute Donna, the author experienced open teaching on healthy diets for cancer patients' families. One elderly postoperative patient, two family caregivers, and one registered dietitian were recruited. Then the author participated in the Moira Peer Support Course held by Salute Donna at the IRCCS Foundation National Cancer Institute and interviewed two middle-aged postoperative patients and a psychologist. Corresponding to the in-depth investigation in Milan, the in-depth investigation in Shanghai was concentrated in December 2019. The author investigated three middle-aged postoperative patients, three elderly postoperative patients, and two family caregivers in the Breast Department of Yangpu District Central Hospital.

Fifteen people were interviewed throughout the in-depth research process. The ages of the interviewed patients ranged from 37 to 81. Family caregivers were in a close relative with patients, such as husband and wife, mother and daughter, sisters. Those medical staffs majored in nutrition and psychology.

4.2.1 Milan in-depth research

(1) Corsi di Cucina cooking course survey:
Time: 2019/3/9 (10:00am-1:00pm)
Location: Salute Donna Teaching Area
Participants: 2 Salute Donna staff, 3 chefs, 1 registered dietitian, 7 participants (including the author)
Activity background: Corsi di Cucina cooking course requires registration one month in advance. There are six courses each month. Participants can choose a single course of 55 euros or a full set of introductory courses of 165 euros. The payment method is online remittance.

• Course teaching environment
There were clear instructions for the location of the courses at the entrance of the teaching campus. There were a shelf and composts for storing seeds on the left side of the door. It passed through a vegetable planting area. The vegetables harvested in the planting area were directly used for cooking courses, and the rest were ornamental plants.

Figure 4.2 The vegetable planting area

After entering the classroom, there was an information desk. There were course materials and introductions other activities of Salute Donna on the desktop. Salute Donna's staff asked participants to fill in their personal information and introduced the participants' activation process. Before the start of the course, the staffs learned about the participants' current situation by chat. The Salute Donna staffs introduced the development history of the cooking course to the author. The teaching area originally belonged to the IRCCS Foundation National Cancer Institute. The Lombardy District Government and the National Cancer Cancer Hospital provided the institution with a cooperation platform and resident doctors. The majority of the participants were women, including cancer patients and family members and friends who had close relationships with the patients.

Figure 4.3 The teaching area

• **Kitchen area**

Hygiene caps and aprons must be worn in the kitchen work area. Chef Giovanni had worked in Salute Donna for five years with a certificate in cooking teaching. He had been to various European countries to inspect healthy recipes every year. The job for the registered dietitian was mainly to direct and helped the chef complete the dishes and explain the cooking skills and related nutrition knowledge. The chef had a good understanding of the dietary structure and family menus required by cancer patients. The chef assistant Monica had worked at Salute Donna for three years. The main task was to complete the kitchen cooking and set up the table before meals. Thirty percent of the ingredients came from the organic vegetable plot in front of the classroom, and 70 percent came from the organic supermarket.

Figure 4.4 The kitchen area

• **Course teaching process**

After the course began, the participants sat side by side facing the semi-open kitchen, and the participants could watch the cooking process. The chef taught at the long table in front of the kitchen and answered questions from participants at any time. Participants could experience multiple experiences from sight, hearing, smell, and taste. The recipes and the ingredients management were introduced at first, and the ingredient source was highly emphasized.

Figure 4.5 The organic cooking course

Next was the explanation and Q&A from the registered dietitian. She introduced the healthy diet recommended by the United Nations and recommended healthy diet books for cancer patients. The author shared some of the latest data related to the diet of cancer patients. It was recommended that breast cancer patients consume more legumes and milk during the Q&A period. Continuous diet therapy was a more effective way than drugs.

Figure 4.6 The nutritionist knowledge sharing

In the final meal sharing session, the chef set up the table and brought out the dishes previously taught. Participants shared their thinking from today's class before the meal. The main topics of discussion were the rehabilitation experience of patients at home and the critical points of family care in daily life. After the meal, the author interviewed an elderly postoperative patient, two family caregivers, and the registered dietitian.

Figure 4.7 The organic healthy dinner

• Participant feedback

Elderly postoperative patient: "I am 68 years old, and it has been seven years since my last operation. I learned about this course at the Salute Donna counter at the IRCCS Foundation National Cancer Institute entrance. Because I work in a hospital, I pay more attention to health information, and I also get in touch with many patients of the same disease. Some patients I know suffer cancer recurrence due to the lack of diet management after surgery, so I think it is imperative to maintain a healthy diet. Besides attending cooking classes from time to time, I have also participated in Salute Donna Nordic walking and yoga classes. When chatting with patients and their families who have the same experience, I feel a sense of belonging. "

Family Caregiver A: "I signed up for a full set of introductory courses, and I participate in class once a week. My mother is a breast cancer patient. After one year of surgery, I read many related books and pieces of literature to help her recover and participated in many activities organized by the hospital center but we felt that the lectures were not targeted. I knew about Salute Donna in a medical magazine. I got a good experience since experiencing the free promotion of Salute Donna. I signed up for Corsi di Cucina because it matched my hobbies. I think that the best communication way for cancer patients is not to treat them as patients and get along with them with a more optimistic and positive attitude. To create more social opportunities for them, we must respect their wishes of course. "

Family Caregiver B: "I have participated in three classes in total and I am ready to sign up for other introductory courses. My sister is a breast cancer patient, and I am also a potential patient at high risk for breast cancer. My younger sister participated in the Moira psychological rehabilitation course after the operation. To bring my younger sister and the whole family a healthier diet, I participated in this course. I am very keen to exchange recipes with my sister after returning home and innovate on the original recipe together, which may help her gain new points of interest and strengthen the outcome of psychological rehabilitation courses. I also met some new friends during the course, and I was able to exchange experiences in taking care of breast cancer patients. "

Registered dietitian: "I am a registered doctor of the IRCCS Foundation National Cancer

Institute, and I will answer questions in every class. Nowadays, people pay more attention to a healthy diet. The pressure of work and the food safety crisis will lead to many cancer diseases. Most of the people who attend the course are the family members of cancer patients or people with healthy eating awareness. They have many common topics and share exciting experiences. Breast cancer patients themselves are more inclined to participate in Salute Donna's Moira and Nordic walking projects. On the one hand, psychological counselors help them relieve stress, and on the other hand, they recover from postoperative limb exercises. "
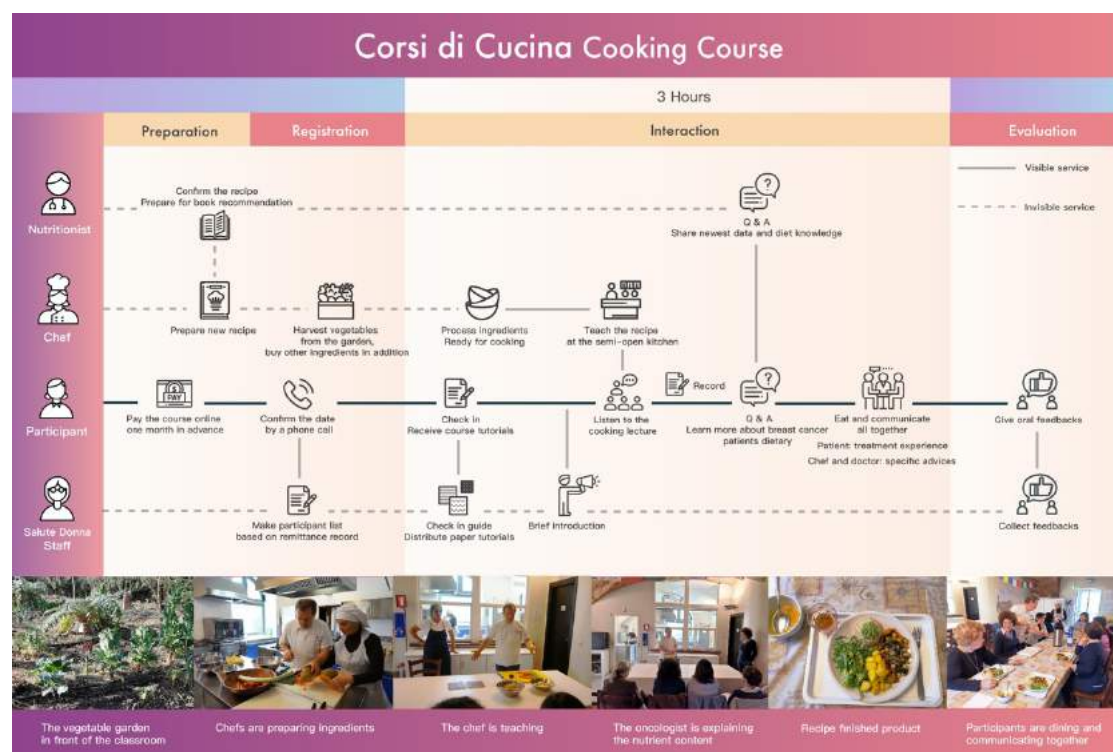
Figure 4.8 Corsi di Cucina cooking course user journey map
Source: The author made

• **Analysis of primary needs**

• Patients, family caregivers

1. Obtain registration information for peer support activities from multiple channels

2. Learn about the latest nutrition-related rehabilitation information and learn healthy recipes

3. Communicate and interact with other participants and share the experience of the rehabilitation process

4. Understand the skills of family internal communication and caregivers to provide psychological support to patients

• Institutional staffs

1. Know the background information of the participants and the patient's medical history in advance

2. Prepare and distribute materials in time

3. Collect participant feedbacks after the event

• **Research summary**

From this survey, the background and needs of the participants can be clearly understood. Peer support is mainly the teaching and answering of experts and the sharing and communication between patients and family caregivers. The highlight of peer support is the table sharing the link of cooking teaching results sharing. All stakeholders can easily find topics during the cooking teaching and patients' recovery experience, they do effectively communication with high emotional concentration under this circumstances.

(2) Moira peer support course survey:

Time: 2019/4/23 (17:30pm-19:30pm)
Location: IRCCS Foundation National Cancer Institute
Participants: 2 doctors (Luciana Murru & Claudia Borreani), 2 clinical psychologists, 2 Salute Donna employees, 14 participants

• **Course teaching background**

The Moira course created a psychotherapeutic group to improve patients' quality of life through physical rehabilitation, meditation, and psychotherapy practices. Specifically, two months of clinical physical and cognitive psychotherapy courses for the patient helped to perform postoperative self-management and return to everyday social life more scientifically. M = meditation/spiritual meditation, which stimulates the self-regulation of the mind/body system; O = observation, determines strengths and behavioral strategies that help manage difficult moments related to illness and treatment; I = improvement, inspires and enhances planning, hope, and attention to the meaning of life; R = relaxation, which increases the mental-physical health state by reducing the stress levels that accompany diseases and treatments; A = addressing emotions, detecting all emotions and thoughts that interfere with the healing process.

The courses are twice a week, each for two hours, and last for two months. The course is free and open to breast cancer patients, and the Salute Donna Foundation funds. Patients are mainly introduced by hospitals or by phone to sign up for participation in the event. Each event contains no more than 20 people, which ensures that the doctor has in-depth communication with each patient and the accuracy of the doctor's final evaluation of the treatment effect.

Under normal circumstances, only patients can participate in Moira because personal medical history and personal privacy are involved in peer communication, and external intervention may also affect the doctor's diagnosis and guidance. After a series of consultations and communication, the doctor allowed the author to conduct interviews before and after the event. During the event, the author could only observe and could not take photos or videos at close distance.

• **Course teaching process**

During the event's preparation phase, participants successively signed in at the information

desk and greeted and chatted with other participants who had already been present. Since the two-month participant list was fixed, most of the participants were in the same period with established friendships. All participants quickly entered the sharing mode and maintained a relaxed state in the course environment.

After the activity started, the doctor introduced the theme of the activity to the participants, and played some videos about the self-management of patients after breast cancer surgery. The doctor analyzed the family and work environment of the patients in the video, and gave the participants suggestions. The doctor listed the self-management methods that were worth learning, such as writing a diary every day, posting reminders to pay attention to physical changes in the bathroom, gathering family members at a fixed time each week to share their treatment results; at the same time, pointing out the patient's improper handling. For example, when you were depressed, you should not choose to stay in the room alone instead of talking to family and friends in time, and eat high-hormone and high-fat fast food when you go out. An ordinary time of this session was 50 minutes.

Figure 4.9 The oncologist sharing session

After the lecture, there would be a group psychological mutual assistance session. The participants were divided into two groups, each with seven patients, one oncologist, one clinical psychologist, and one organization staff. The clinical psychologist distributed personal forms. There were three sections on the form: "Physical Rehabilitation", "Psychological State", and "Comprehensive Description", including basic check questions. Simultaneously, a space for personal records was reserved for patients, which would be unified at the end of the activity. The psychiatrist guided the patients to fill in the fundamental questions on the form and then guided everyone to take turns to talk about the recent changes and provide professional advice to the patients.

• **Psychological mutual aid peer support**
After the operation, ***the middle-aged patient A*** said that she could start doing some simple housework, and the pain was reduced when he raised his arm. Her two children took the initiative to massage her to keep her happy. She gradually stabilized her mood no longer like she was prone to depression and self-denial a month ago, and her insomnia at night has also improved. However, she still feels anxious when receiving phone calls from friends and

colleagues at work or greetings on social platforms. She believed that her departure from the workplace in the past half a year had seriously affected her work progress. She was very concerned about whether she could re-adjust to the working environment which depended on her boss's attitude. After describing the first patient, the rest of the patients took turns to express their thoughts and give suggestions. After the middle-aged patient, she took notes in her notebook according to the doctor's prompts and selected the doctor's sticker tools to collect them in the notebook. What's more, she recorded all information on paper forms, and wrote down personal thoughts and keywords at the time. The psychiatrist gave specific suggestions on the career problems of patient A, for example: communicate with the company's project manager remotely every month. If it was permitted, ask the manager to share the project's progress, and the patient may give his pieces of advice to enhance the sense of participation. The oncologist proposed to gently press during the shower to check the wound, perform a wrap-around massage according to the direction of the lymph, and release the pressure by singing in the bathroom.

After that, all participants took turns to talk about and share themselves, and the sharing session lasted for one hour. After the doctor retrieved the form, the paper form will be archived, essential data would be entered, and email suggestions would be sent based on each form's specific content twice a week. After completing the two-month course, each person's file would be returned to the person, becoming a vital record template and providing a reference for the patient's follow-up home rehabilitation in the next four months.

Figure 4.10 The peer sharing session

Psychologists were in a dominant position throughout the event, showing a reliable and professional image. Salute Donna staffs were required to go through six months of training to understand the precautions for communicating with postoperative patients, assist doctors in diagnosis and treatment, which mainly responsible for on-site scheduling and content recording.

Figure 4.11 The group photo of interviewees

• **Research interview**

The author then conducted unstructured interviews with middle-aged postoperative patient B and psychologists. The interviews' details are recorded in Appendix B.

Middle-aged postoperative patient B said that she was hospitalized for nearly three months after the operation, and the attending doctor recommended her to participate in the course. She believed that Moira regained her confidence from physiology to psychology. Each class had different themes and focuses. In this course, doctors analyzed video cases to let patients understand the precautions in life. There was yoga training in the previous class. The instructor lead the patient to perform stretching exercises to eliminate postoperative lymphedema. In the routine part of peer communication, patients shared progress and troubles in the rehabilitation process, they also got suggestions and established social groups outside the classroom. Patients regularly met with their peers and doctors every week and insisted on using a notebook to record their personal daily status, however they doubted the persistence after the course. By participating in the course, the patient's mentality became positive, and the gap between the family members and patients was narrowed.

The psychologist said that the patient's psychological rehabilitation was a constantly changing process. Each patient's family environment and social environment were different, so patients need to get more targeted advice. Based on clinical psychology's scientific benchmarks, they used the experience-based co-design method of multi-collaboration to evaluate the personal forms twice a week and gave personalized recommendations. At the same time, patients were encouraged to take the initiative and create a better family environment by themselves. For example, taking the initiative to communicate with their family members, finding family members to accompany when they are depressed and anxious, and making the sharing of lessons learned as homework. The challenge for doctors was to open patients' hearts, share their own experiences and naturally build a relationships between patients and peers. The two-month course arrangement had allowed patients to form a self-management concept. The NGO staffs had always encouraged patients to record their progress by diaries and photos forming their reward mechanism, and encouraging family caregivers to actively cooperate with the course arrangements at the same time.
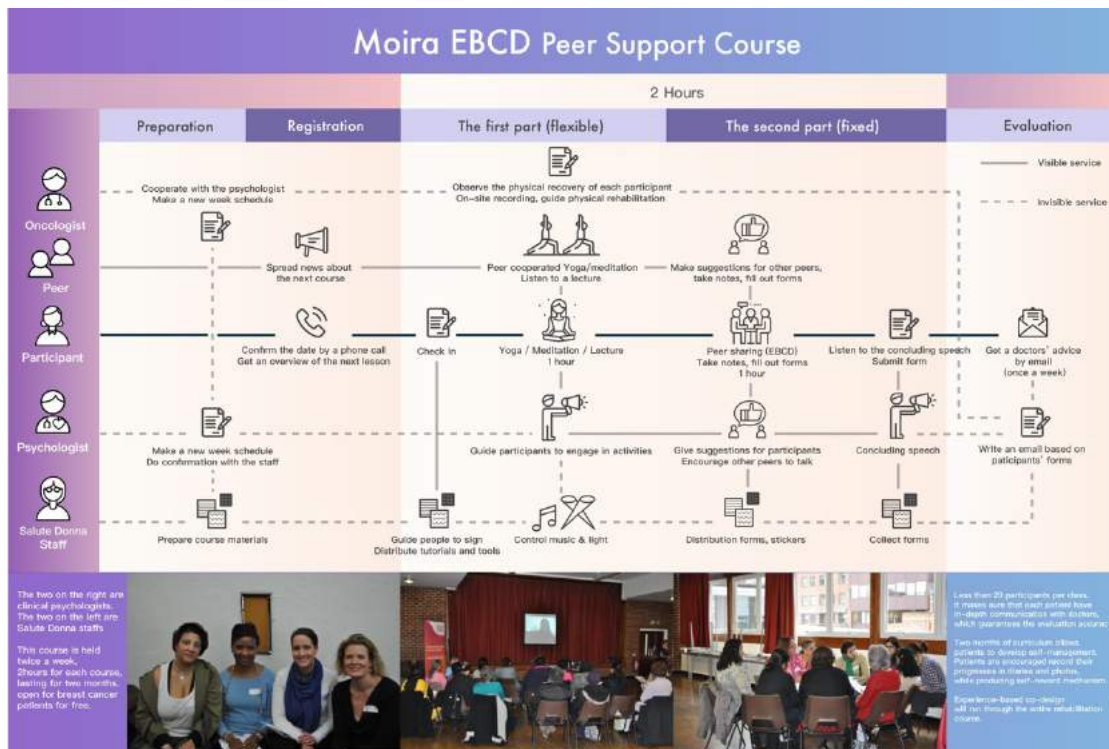
Figure 4.12 The Moira course user journey map

Source: The author made

• **Analysis of primary needs**

• Patients

1. Obtain registration information for peer support activities from multiple channels

2. Obtain the introduction guide of the course in time

3. Share recent recovery experiences, emotional changes, and get suggestions and feedback from peers (patients/doctors)

4. Develop the habit of personal recording, be familiar with personal recording tools, and keep the habit after the course

5. Learn about the skills of internal family communication and share emotions with family caregivers

• Psychologists, oncologists

1. Guide patients to establish emotional connections, maintain the psychological mutual assistance communication, and create a communication atmosphere

2. Collect the rehabilitation change form of each patient, form personal rehabilitation profiles, and give specific suggestions

3. Hold regular meetings and discussions with the person, in charge of the institution around the patient's rehabilitation assessment, update the content of the course

4. Keep in touch with NGO staffs, understand patient feedback, and optimize the details of the course process through discussion

• NGO staffs

1. Collect the participants' background information in advance and follow the patient's course

progress

2. Do timely materials preparation and distribution, as well as the recovery of crucial rehabilitation forms

3. Collect feedbacks from participants after the event, and discuss ways to optimize the course with the doctor

• Research summary

The audience of this survey is more targeted, and the form of peer support is more professional. The intervention of multiple medical and nursing roles ensures the quality of patients' rehabilitation. Among them, the form of sharing records of mutual assistance peer support can be used as a reference for patients to self-manage at home, and it is also the director of the following design and peer support application.

4.2.2 Shanghai in-depth research

(1) The first survey of Yangpu Central Hospital:

Time: 2019/11/29 (10:30am-1:30pm)

Venue: Department of Breast,　Shanghai Yangpu Central Hospital

Participants: 3 middle-aged postoperative patients (labeled as patients 1, 2, and 3), and 2 interviewers (including the author)

• Research interview

Under the doctor's recommendation, the two interviewers were able to enter the ward for in-depth interviews. The interview was mainly divided into four parts. The first was to understand the fundamental personal information of the patient, and the second was to understand the key events of the patient in the postoperative rehabilitation process and the participants who provided peer support, and then to understand the patient's behavior in the rehabilitation process, and finally know more about changes in the patient's emotional thoughts.

Figure 4.13 The interview record of patients No.1, 2, and 3

Patient No. 1 had a relatively negative psychological response, she adopted an evasive attitude towards postoperative rehabilitation learning, and obtained most of the peer support based on the care of the affected area and doctor-patient communication.

Patient No. 2 adopted a positive and optimistic attitude in physical and psychological rehabilitation, she knew how to use online resources for self-psychological counseling appropriately, and actively participated in WeChat online patient group discussions. She spent time online on playing leisure games, searching Baidu news, and watching the poem variety show. She paid attention to the WeChat group of patients, emphasized that she screened positive content in the chat group, and shared rehabilitation information and follow-up precautions with the peers. At the same time, she took the initiative to pay attention to follow-up after discharge and obtained peer support from family caregivers and psychological peer support from online patients.

Patient No. 3 had a calm mind, she stayed the longest in the hospital. However, as for obtaining peer support she was similar to that of Patient No. 1, and the feedback content was less.

• **Analysis of primary needs**
• **Patients**
1.Establish online social contacts with patients, exchange experiences, and gain encouragement
2. Learn about the latest rehabilitation follow-up information through the Internet and share with patients
3. Relieve stress, anxiety and depression through online entertainment tools
4. Maintain communication with medical staffs

• **Family caregivers**
1.Bring a sense of peace of mind and companionship to patients by taking care of their daily lives
2.Obtain online peer support and guidance knowledge and information on patient rehabilitation precautions

• **Research summary**
Shanghai's public medical institutions are in short of hospitalization resources. Patients are usually discharged after being approved by a doctor from 10 to 20 days after surgery. Due to the short stay in the hospital, the relationship between patients and peers in the same ward is relatively shallow, and most of their peer support provided by family caregivers. Some patients take the initiative to explore online patient resources, the online community is mainly WeChat platform, and some patients with a sense of peer support have begun to pay attention to various follow-up channels. In terms of doctor-patient communication, middle-aged patients are proactive and trust the hospital arrangements.

(2) The second survey of Yangpu Central Hospital:
Time: 2019/12/6 (10:00am-12:30am)
Venue: Department of Breast, Shanghai Yangpu Central Hospital

Participants: 3 elderly postoperative patients (labeled as patients 4, 5, and 6), 2 family caregivers, and 1 interviewer (author)

• Research interview
Under the recommendation of the doctor, the author went to the ward for an in-depth interview. The interview structure was the same as that of the previous three middle-aged postoperative patients.

Figure 4.14 The interview record of patients No.4, 5, and 6

Patient No. 4 was super-aged and has obvious obstacles in physical rehabilitation. During the interview, due to the patient's hearing and expression impairment, her daughter was responsible for conveying the patient's thoughts and sharing the experience of being a caregiver. The caregiver reported that the efficiency of doctor-patient communication directly affects the quality of rehabilitation services. Informing the medical staff to change the bottle and deal with the patient's emergencies is vital. The peer support of patient No. 4 mainly comes from the family caregiver, and the family caregiver actively communicates with other patients and family caregivers in the ward.

Patient No. 5 had a positive mentality and had been recommended by a friend to appoint a doctor for treatment and established a highly trusting relationship with the doctor. In addition to essential family caregiver care support, patients were proficient in using social software to share recovery progress with their family members in different places. Through communication with doctors, I learned about the frequency and importance of follow-up after discharge and received psychological support from doctors.

Patient No. 6 was optimistic and active, proficient in operating various online news platforms (Baidu News, Toutiao News), she actively searched for postoperative rehabilitation-related information. Moreover, she established patient groups in karaoke community app and conducted peer support discussions through online social networking. Family caregivers had a strong sense of subsequent treatment support and planed in detail after discharge. The relationship between family caregivers and the patient are the couple, mother-in-law and daughter-in-law, and their family is harmonious. Due to the daughter-in-law's meticulous care, the patient and caregivers showed two-way positive psychological feedback.

• Analysis of primary needs
• Patients
1. Establish online social contacts with patients and family members from other places, and urge patients to encourage themselves at the same time
2. Learn about the latest rehabilitation follow-up information through the Internet and share

it with patients

3. Relieve stress and relieve anxiety and depression through online entertainment software

• Family caregivers

1. Maintain close communication with medical staff

2. Bring a sense of peace of mind and companionship to patients by taking care of their daily lives

3. Obtain online peer support and guidance knowledge and information on patient rehabilitation precautions

4. Understand the specific arrangements for follow-up of patients after discharge from the hospital, and act as a supervisor

• Research summary

Due to the hospital's short stay, the lack of NGO intervention, and scarce rehabilitation courses after discharge, there is insufficient resources for offline peer support services from a realistic angle. Due to the high Internet penetration rate in China, except for ultra-elderly patients, most patients reach various online peer support channels. Some patients even take the initiative to establish online patient groups and make good use of online medias (photos, audios, videos) to share their rehabilitation experience, allowing peer support throughout daily life. The family caregivers of all postoperative patients are mainly responsible for the basic care, and some family caregivers are concerned about the follow-up arrangements after discharge. In terms of doctor-patient communication, there is little difference between elderly patients and middle-aged patients. The decline in physical function of elderly patients also requires family caregivers to take on more communication responsibilities and pay more attention and attention except for extreme visual and hearing impairments.

4.3 Analysis and summary

4.3.1 Comparison of existing peer support systems between two cities

Summarizing the results of in-depth investigations in two cities, the author sorted out the two peer support service systems. As shown in the figure, patients in two cities receive the similar peer support from patient peers, and the community. In terms of the quality of family caregiver support, the family caregivers in Milan have more connections with medical staffs and NGO staffs. Family doctors' multi-faceted peers support education and guidance and have more robust academic support in implementation quality. The postoperative medical team in Milan includes rehabilitation experts, psychotherapists, and registered dietitians. They provide peer support through offline follow-ups, while the postoperative medical team in Shanghai comprises a single team. In addition to offline follow-ups, the online platforms have gradually increased in recent years. Two systems have their own advantages, while establishing personal digital follow-up profiles is the common development trend.

The rehabilitation institution differences in the two cities lead to the divergence in the peer support. The rehabilitation institutions in Milan has professional effectiveness evaluation tools. Patient profiles system provides medical staffs with medical observation. NGO staffs perform as the communication bridge. As far as the government is concerned, providing certain financial subsidies for the operation of public medical institutions and community organizations is the critical policy. From the other side, the government plays an invisible role since there is no substantial policy innovation, professional training in the service development blueprint.
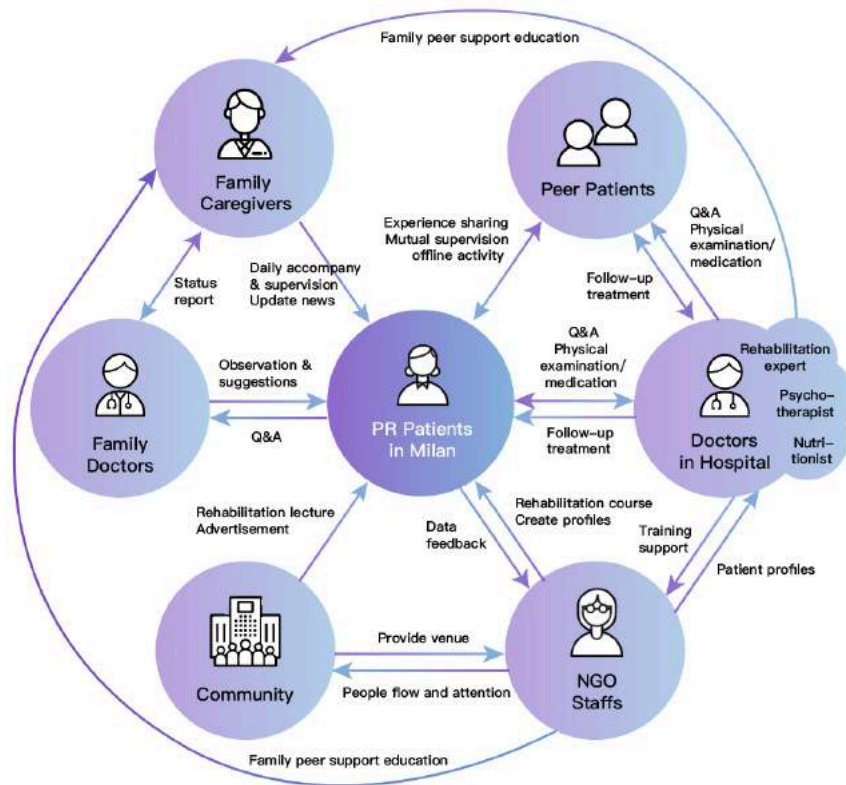
Figure 4.15 The peer support system status in Milan
Source: The author made
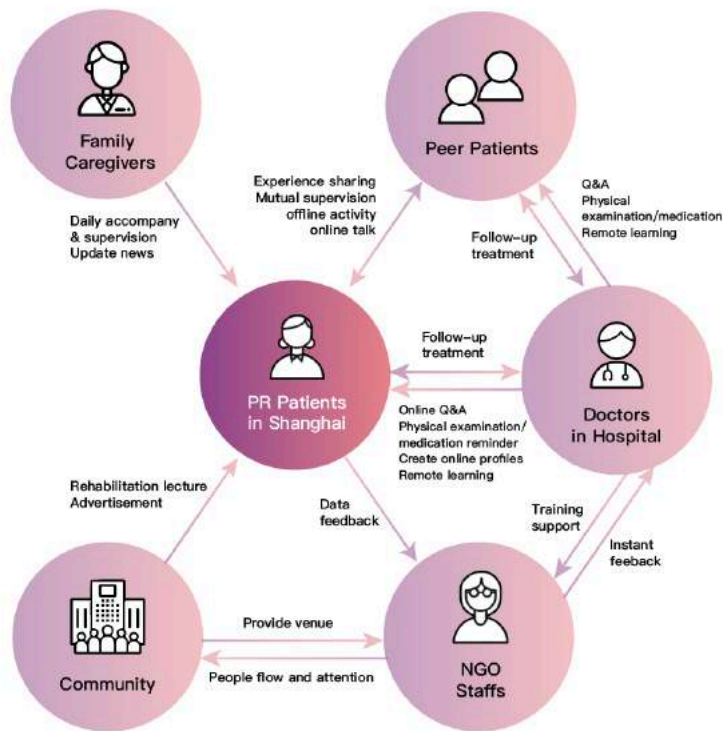
Figure 4.16 The peer support system status in Shanghai
Source: The author made

4.3.2 Research process and core insights
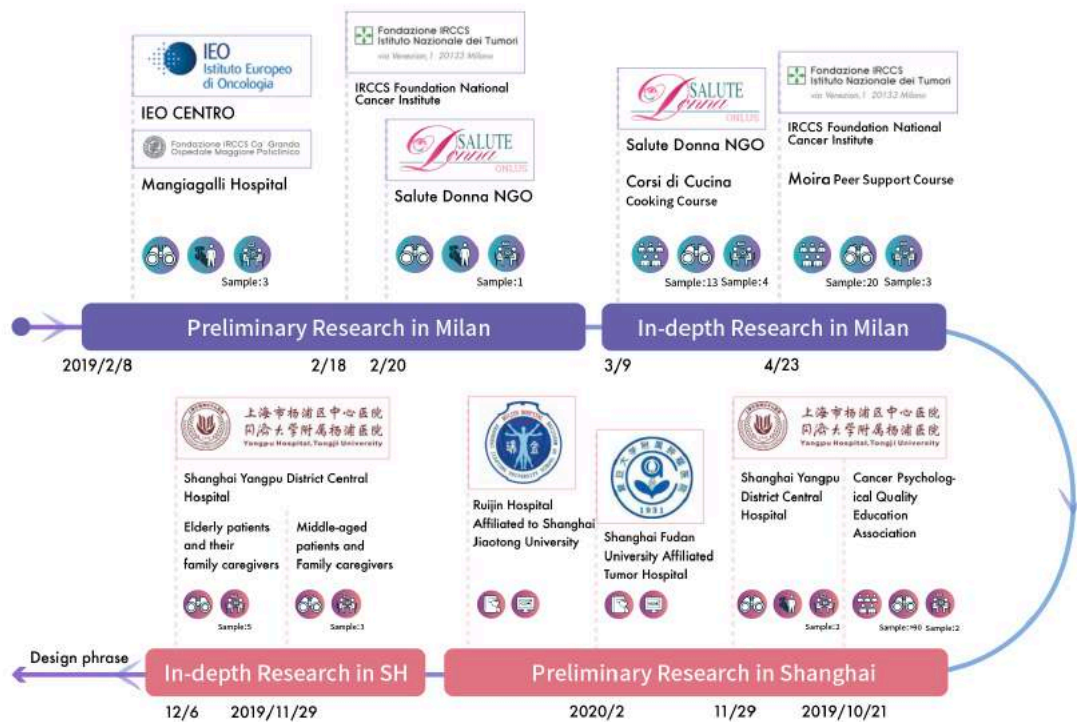
Figure 4.17 The research flow map
Source: The author made

The author did preliminary investigations on Milan's Mangiagalli Hospital public hospital, IEO CENTRO private hospital, IRCCS Foundation National Cancer Institute, and Salute Donna Women's Health NGO. During the immersive participation in Salute Donna's rehabilitation courses, the author learned that it is well known for cancer care service in Italy. Under the social medical system, breast cancer patients receive a full range of hospital diagnoses and treatment and full-process peer support services after discharge. Because of this, the process of implementing peer support for patients depends on the curriculum services provided by institutions or communities. After completing related courses, peer support inside the family is difficult to maintain self-drive, and the service quality may decline sharply.

The author conducted the preliminary investigation of Ruijin Hospital Affiliated to Shanghai Jiaotong University School of Medicine, Shanghai Fudan University Tumor Hospital, Shanghai Yangpu District Central Hospital Affiliated Hospital Breast Cancer Mental Quality Education Research Association. Moreover, the author carried out In-depth interviews with inpatients in the Yangpu District Center hospital revealed that public medical institutions are in short supply under China's social medical system. Individual breast cancer patients cannot receive long-term attention from the medical team after being discharged from the hospital. The form of offline peer support is sole after discharge, and the lectures held by the hospital affiliates in the community are not high in participation, and the social impact and sustainability are weak. With the rapid development of the Internet and smart medical care, the online peer support

form of well-known research institutions in China has gradually developed in a scale in recent years. This form reduce the restriction of geographical distance and lower the barriers to participation. It can be integrated into the daily family peer support, which is a complement to the medical system.

The Italian breast cancer registry study released by the National Library of Medicine and the National Institutes of Health in 2017 shows that the average length of hospitalization for breast cancer patients in Italy is 22 days after surgery[52]. In comparison, as pointed out in an article in China's "Modern Medicine" in 2014 The average postoperative hospital stay of Chinese breast cancer patients is 13 days [53]. The data difference between the two cities is related to hospitalization expenses, medical resources, and the pace of social life. The author integrated literature reviewn and field research to compare peer support charts in the two cities.
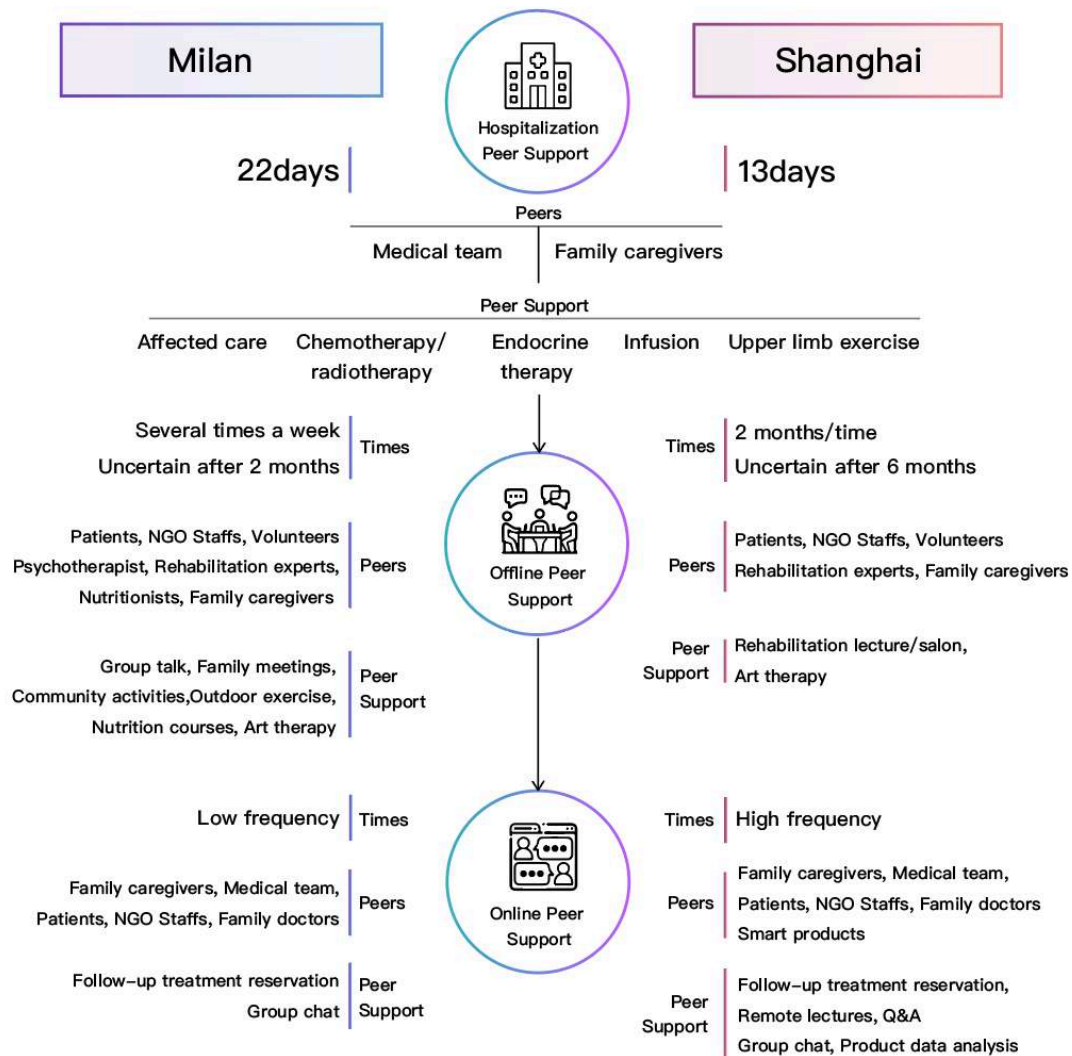
Figure 4.18 The comparison of peer support for patients in two cities
Source: The author made

4.3.3 Identification of design opportunities (How might we)

Based on the first four chapters, patients in both cities receive homogeneous nursing peer support provided by medical staffs during their hospitalization. The best intervention point in service design is to give full play to the patient's initiative after discharge. Combined with the analysis of the in-depth investigation results in Chapter 4, the author conducted a visualization of design requirements and a matrix analysis of peer support scenarios after discharge.

The visualization of design requirements shows the relationship between peer support specifications, collaboration, and goals in two cities. First of all, patients, family caregivers, and medical staff simultaneously realize the importance of instant interaction, group incentives, and tool assistance and form a consensus, which is a prerequisite for promoting innovation in peer support services. Peer support and collaboration is the second step. All stakeholders in the system have established consensus, and designers can fully intervene to optimize the interactive experience between doctors and patients, patients and patients, and patients and platforms. In the third step, peer support goals include individual improvement, efficiency optimization, and joint health. The three indicators suggest that after the emergence of innovative services for peer support and collaboration, the health of individuals and groups of patients will be effectively improved. Peer support services need to be continuously innovated with changes in the social environment and technological applications. Therefore, the design requirements themselves should also be recyclable and self-renewable.
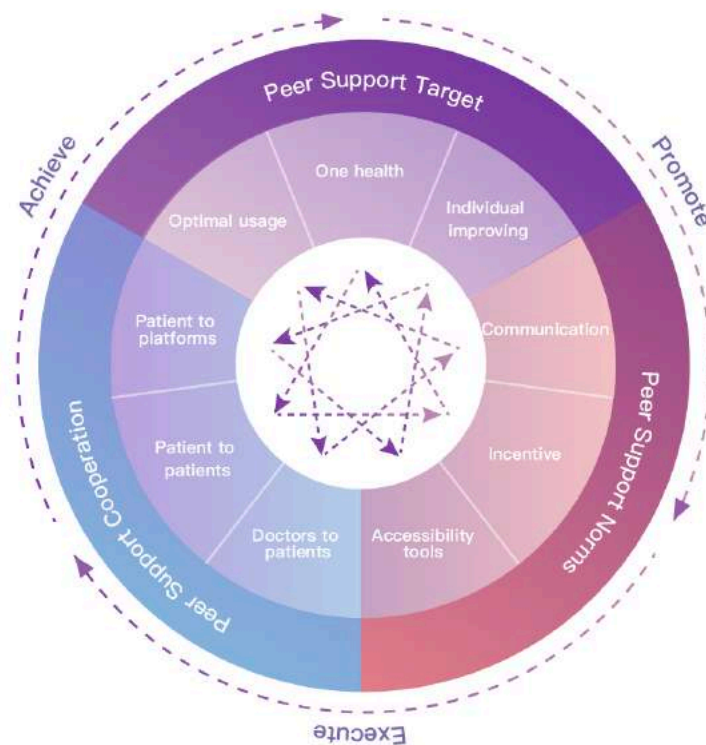
Figure 4.19 The chart of design principle
Source: The author made

The center of the matrix shows two channels of peer support. The two horizontal coordinates are peer support providers, and the vertical coordinates are different content forms. The four quadrants basically cover the peer support scenarios of patients after breast cancer surgery after discharge. At present, the focus of peer support for patients in Milan is offline activities organized by hospitals/institutions, while the focus of patients in Shanghai is online interaction with hospitals/institutions. Inclined, two places have formed a model suitable for the local population's characteristics in terms of hospital/institutional patient support. Due to the large number of stakeholders involved in the hospital/institution organization, and the uneven development in two cities, there are too many uncontrollable external factors in the design process. The author will focus on exploring the scenes in the family, looking for family internal support. The connection point for institutional patient support. The design part will focus on the following issues:

(1) How to motivate patients and family caregivers to provide intra-family peer support on their daily life?
(2) How can family caregivers better supervise patients maintain a daily medication, healthy diet, and aerobic exercise?
(3) How to transmit the rehabilitation data to the medical team for long-term observation?
(4) How to share information about postoperative rehabilitation and peer support with patients and family caregivers in time?
(5) How to guide family caregivers to accompany patients and develop their personal hobbies?
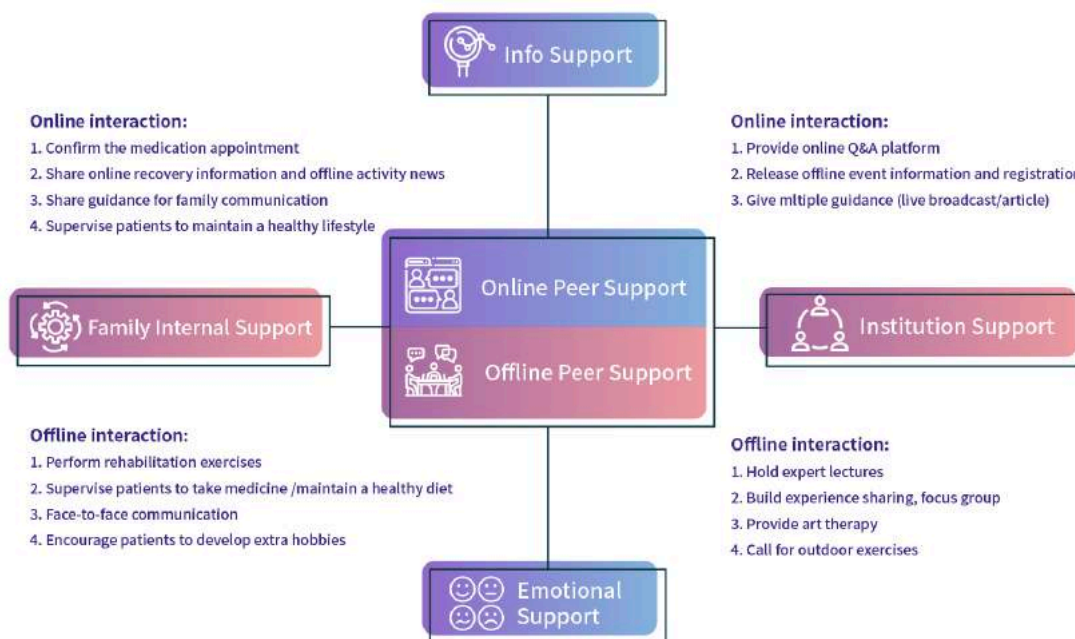
Figure 4.20 The peer support matrix
Source: The author made

Entering the design stage, the author will further explore patients' needs through collaborative design workshops and one-on-one interviews. A collaborative design workshop refers to the designer as the organizer and enabler, through the workshop's form to involve

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stakeholders in the process of conceptual design, bringing in their own experience and creativity, and jointly producing new design concepts. This means that the designer is no longer a mere creator in the workshop but assumes an organizer's responsibilities and an enabler. In collaborative workshops, it is often necessary to prepare some tools to encourage participants to express their creativity, such as user roles and scenario enactment, question cards, touchpoint cards, etc. [54].

Chapter 5 Design Output and Evaluation

5.1 Milan design output and evaluation

5.1.1 Co-design based on postoperative peer support scenarios

(1) Description of collaborative innovation tasks

The collaborative design workshop will discuss the five questions raised by the identification of design opportunities. Take the family's internal support section as the core, the specific task is to interact and communicate with participants with the help of co-design tools and learn from in the process of interaction:

1. The necessary information of the patient and the status of postoperative peer
2. The patient insists on the method of self-management after the operation;
   The role of the family caregiver
3. The way and medium for patients to record rehabilitation data;
   How family caregivers and medical staffs obtain data and give specific suggestions
4. Channels for patients and family caregivers to obtain rehabilitation information in daily life;
   What type of information is concerned
5. The patient's experience of participating in offline activities supported by peers;
   The relevance of activity types and personal hobbies

(2) The specific process of collaborative innovation

Time: 2019/6/24 (10:30am-12:30am)
Location: Salute Donna Administrative Office
Participants: Two postoperative patients (both are Salute Donna administrative staff at the same time), a family caregiver, an organizer (author), and a photographer

Before starting the workshop, the author introduced the purpose of the co-design workshop to all participants and briefly introduced each others. The author quickly stated that the content of the workshop's information would be completely confidential and only be used for academic research projects on campus, not for commercial purposes. After the participants all agreed, the first session was officially started.

Figure 5.1 The ice-breaking session and the boundary object

• The first session: Panda Ice Breaking Session (Time: 30 minutes)

The author displayed a panda doll dressed in postoperative lymphatic massage cloths to guide participants telling stories and marking their most profound postoperative moments. The panda toy worked as a boundary object and played a role in opening up the topic and enlivening the atmosphere.

The patient Julia was 72 years old and had two grandchildren. She told everyone about her experience of two breast cancer surgeries and her personal recovery journey. The two operations took place 20 years and 15 years ago. When she was first diagnosed with the later relief, she gradually accepted the physical and psychological changes from the wandering fear. Her family is the most important supporter.

The patient Rita was 69 years old and had a daughter who lives in a different place. She was the administrative manager of Salute Donna. After the operation, the most challenging decision for her was whether to undergo chemotherapy. She believed that family members could not provide any professional advice, and doctors were not able to systematically and timely gave rehabilitation plans. This was the worst experience.

The family caregiver Silvia was 24 years old, and her mother was a 53-year-old breast cancer patient. When she was 18, she often accompanied her mother to the hospital for examination—feeling worried after the mother's first surgery. According to her observation, the mother became very pessimistic and unconfident after the operation and blamed many breast cancer things.

• The second session: Description of peer support experience (Time: 70 minutes)
Tool A: Postoperative Journey Map

The author used Tool A to guide participants experience sharing of peer support after surgery. The horizontal headings from left to right for the different stages were the operation to be defined by the patient, and the vertical headings from top to bottom were the specific experiences of peer support experience, actions, and thoughts.

Figure 5.2 The journey mapping

From the two patients' feedback, it could be seen that the two patients received support from the medical team, peers, and family members after the operation with a strong sense of self-management. The family peer support was relatively weak in the experience mapping. The author learned from the dialogue that the family peer support was the aid of rehabilitation exercise and companionship in the entire rehabilitation process. The patient's adherence to postoperative self-management stems from the internal drive of reintegrating into the social circle and the workplace. Family caregivers acted as an encourager and supervisor. The family caregiver said that her mother was in a state of depression and extreme inferiority for a long time after the operation. Compared with the other patients, her mother needed more external encouragement and positive psychological guidance.
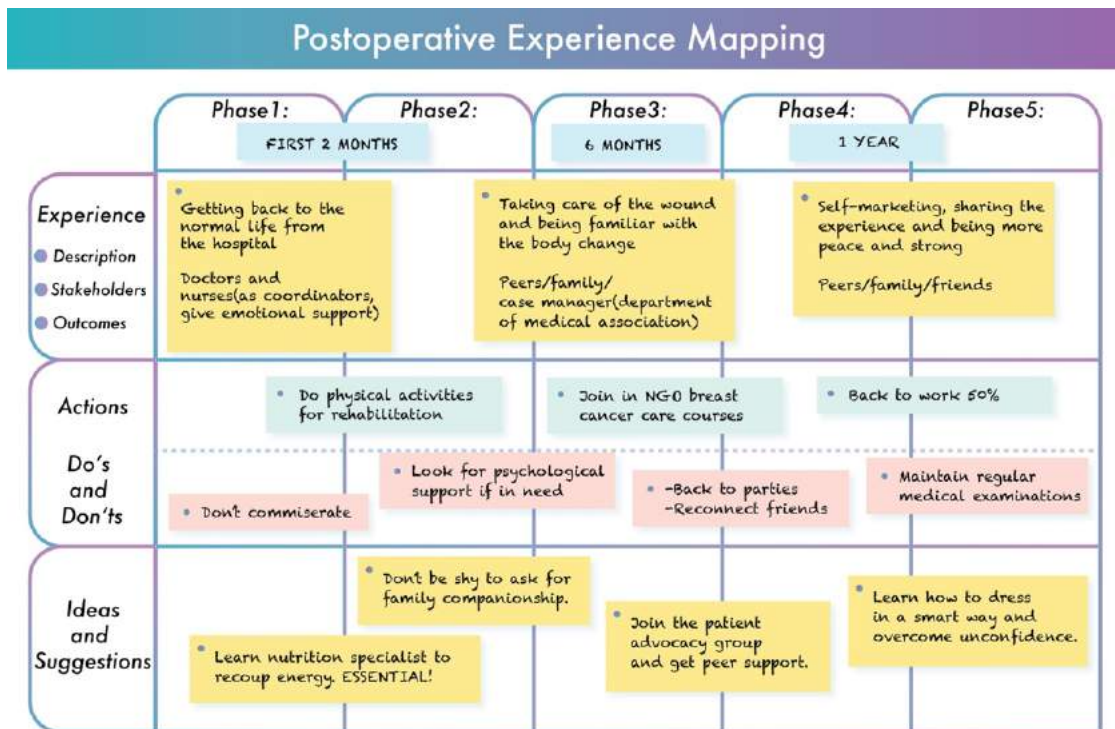
Figure 5.3 The Tool A: Postoperative Journey Map
Source: The author made

88

Tool B: Rehabilitation Record Chart

The setting of different sections in Tool B questioned about the current methods and media for patients rehabilitation data recording. Two patients said that they did not have the habit of making daily recovery records. The existing records are paper reports provided by the medical team, psychologists, and family doctors since they lack motivation and time. Patients believed that the most important information which supposed to be recorded are medication, exercise, diet, doctor's advice, and recovery time management. Family caregivers should provide supervision and rewards in the meantime. Patients were willing to share individual information with the medical team, patients, and family members, but they were very wary of social medias due to the confidential problems. In daily life, the channels for patients to obtain rehabilitation information were paper-based newspapers and periodicals, a small amount of TV programs and digital reports on healthcare websites, and the types of concerning information are pictures and texts of popular science guidelines. The family caregiver said that she had always neglected to accumulate and supervise patients' rehabilitation data and believed that a good communication platform should be established between patients, family caregivers, and medical institutions.
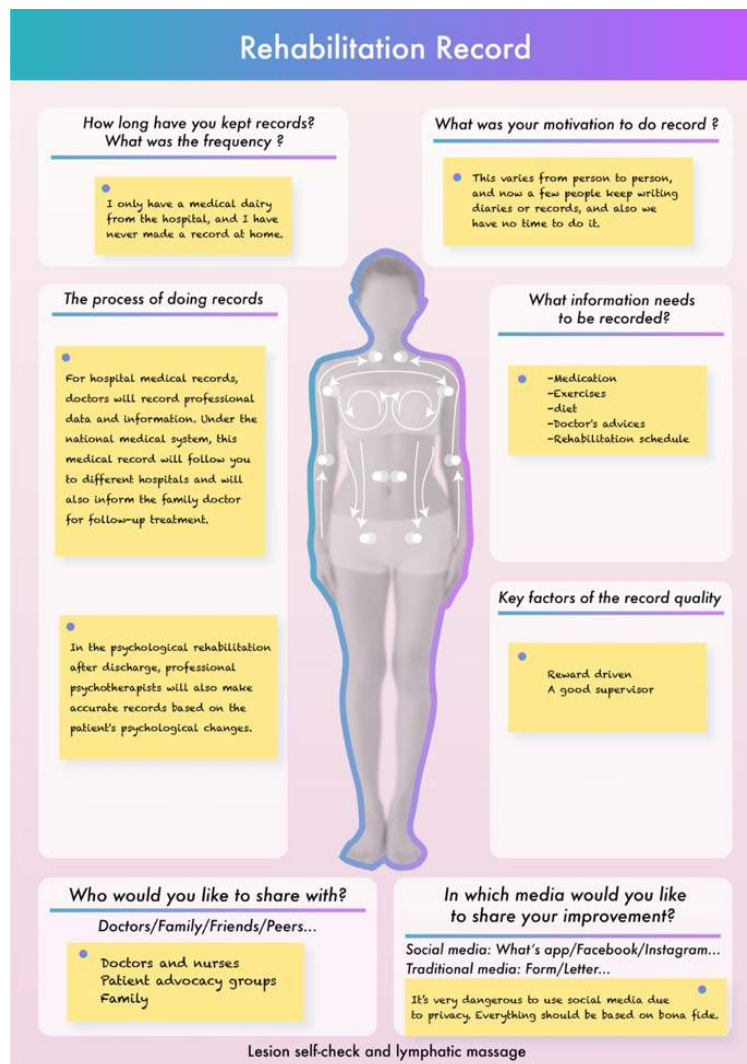
Figure 5.4 The Tool B: Rehabilitation Record Chart

Source: The author made

Tool C: Peer Support Chart

Tool C is designed to understand the patient's experience of participating in peer-supported offline activities, the relevance of peer support activity and personal hobbies. It allowed family caregivers provide ideas during the activities. The author drew 12 kinds of activity cards for patients to choose 4 of them and set a blank area next to patients' selection area to fill in freely.

Figure 5.5 The Tool C: Activity cards

The activity exploration section results were in patients favor, such as flower art, reading, and painting. The patient recommended Salute Donna's Nordic Walking course in the free fill-in area. Patients, peers, and family caregivers were all involved in the activity. Two patients also said that they tended to face-to-face offline activities compared to online event organization and group communication. The family caregiver said that her mother was occupied on work days and she occasionally sent messages on social media patient groups to participate in activities organized by institutions or communities on weekends. Two patients mentioned that they hoped to have a paper rehabilitation manual for patients and family caregivers to do peer support activities at home as a reference.
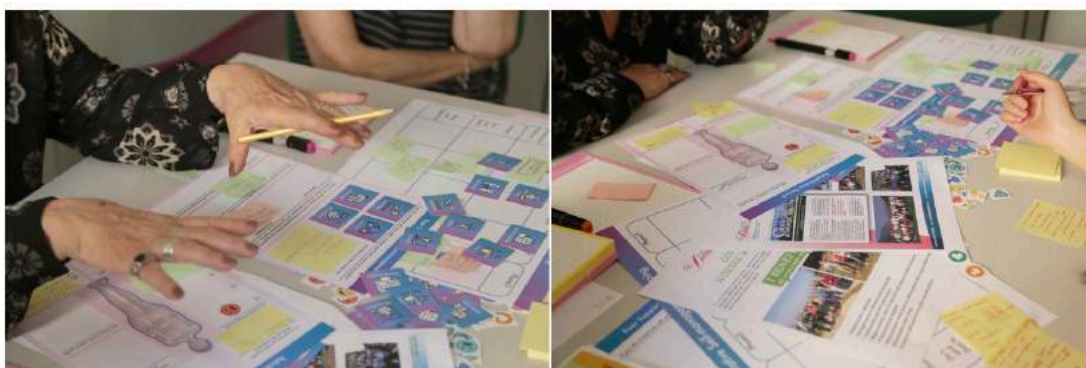
Figure 5.6 The discussion process

Figure 5.7 The Tool C: Peer Support Chart
Source: The author made

• **The third session: Question and answer (time: 20 minutes)**

Figure 5.8 The NGO founder introduction

As the agency's administrative manager Rita shared the rehabilitation story of the founder of the agency and shared her rich experience in event organization and operation. She believed that peer support had always been the core content of Salute Donna's rehabilitation courses. After this collaborative design workshop, she paid great attention to the effective transmission of patients' rehabilitation data and maintained timely communication with the medical institution's person. She seriously considered the after-school expansion supported by the patient's family companions and family caregivers' education and guidance to set up new courses.

(3) Analysis and insights on co-design

The author summarized the specific direction of demand insights and design from patients' and family caregivers' perspectives.
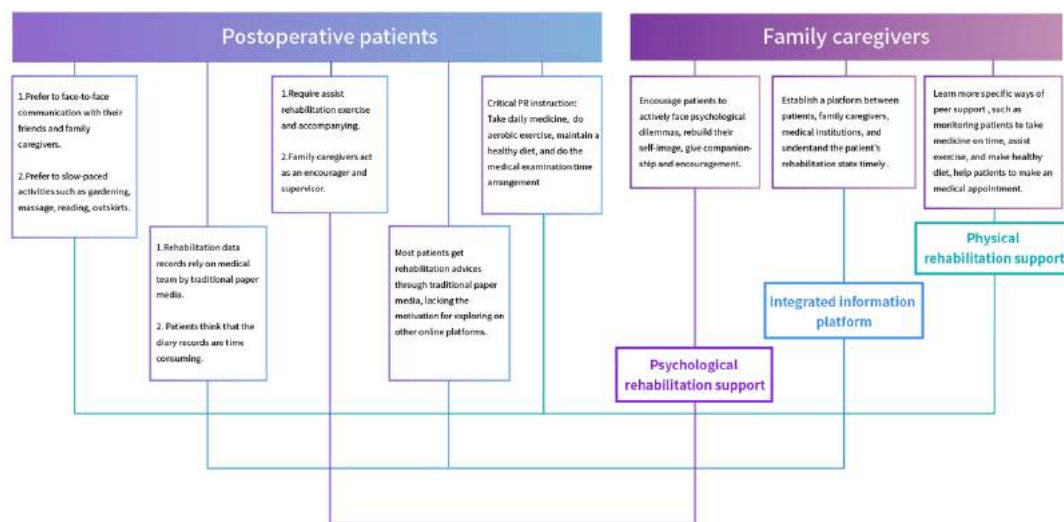

Figure 5.9 Co-design insights
Source: The author made

From the above insights, three aspects of the design can be derived: psychological rehabilitation support, physical rehabilitation support, and integrated information platform. The design focus of psychological rehabilitation support is to allow patients to experience the sense of companionship brought by family caregivers and affirm the stage rehabilitation achievements of patients; the design focus of physical rehabilitation support is for family caregivers to supervise them medication, diet, exercise etc., and do participation in offline peer support activities with patients; the design of the integrated information platform focuses on the need to assist patients in completing rehabilitation data records efficiently, and track these data and feedbacks in time.

5.1.2 Service touchpoint design

Based on the result analysis and the insight of collaborative innovation, the author carried out service innovation to meet Milan patients' needs and refined the critical touchpoints in the service system. The name of the service is "Bcare", which has two meanings. On the one hand, it is the abbreviation of Breast Cancer Care, which highlights the core function of the service. On the other hand, the pronunciation is the same as "Be Cared", which means that patients are cared by stakeholders, and it emphasized the connotation of family peer support. The figure below is the service journey of patients and family caregivers. The solid line is the interaction between the patient and the family caregiver, and the dotted line is the interaction involving other stakeholders. The interaction of different roles at different service stages constitutes the overall service flow chart below. The design of patient contact points adopts traditional paper-based media based on the author's understanding of patients characteristics. Family caregivers use an online platform that can quickly inquire and share patient data with medical staffs.
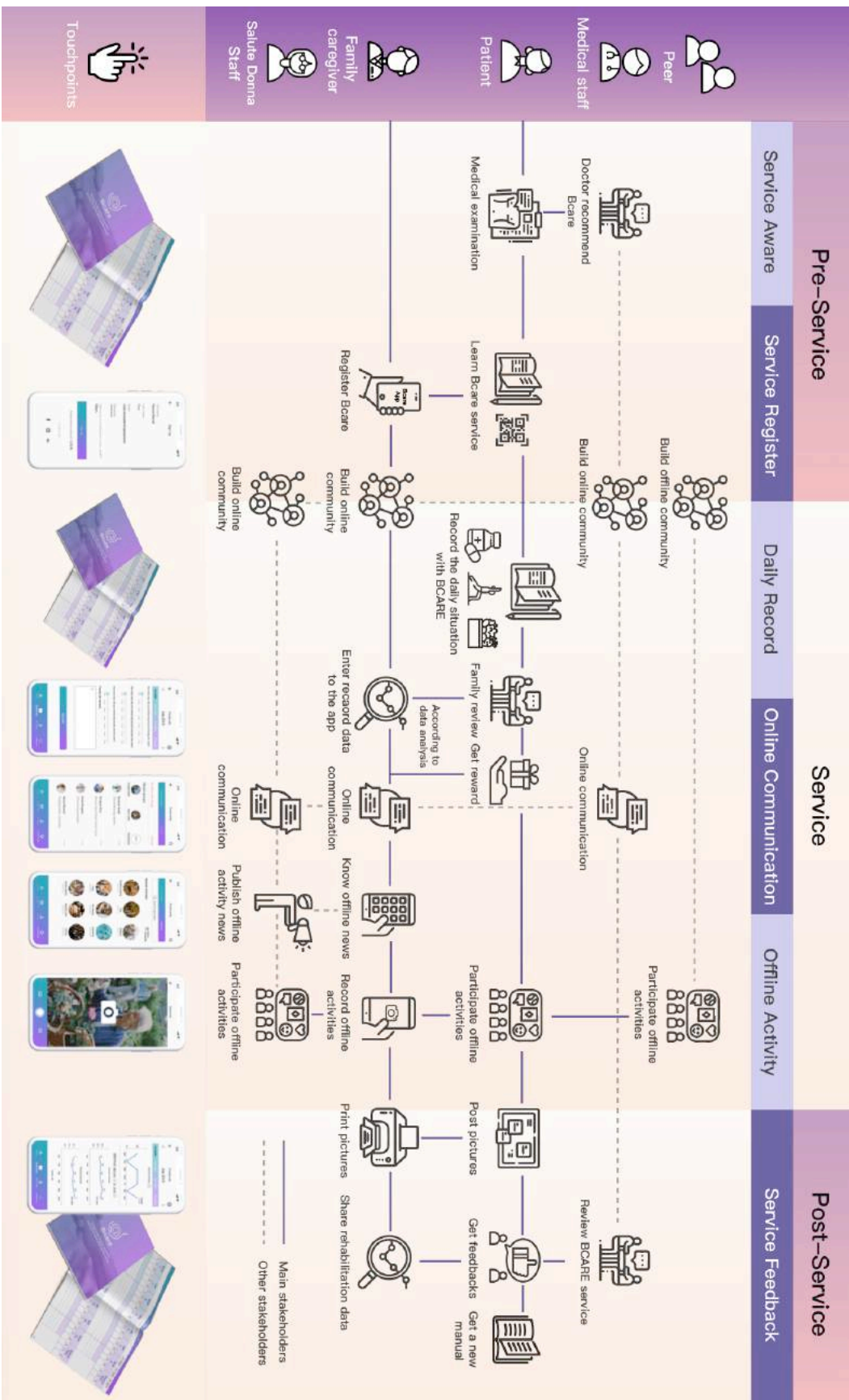
Figure 5.10 The service journey
Source: The author made

The service has two main functional sections, namely the continuous input section of the patient's rehabilitation data under the family caregivers' supervision, and the other is the offline social activity peer support.

In the rehabilitation data input section, the patient uses the Bcare rehabilitation manual to learn about fundamental knowledge, postoperative exercise image guidelines, healthy eating guidelines, etc., and three items (Medication /Diet/Exercise) are listed on the daily record page form. The patients mark "Completed" or "Incomplete" by a simple tick or cross, and write down the notes (physical examination schedule/doctor's advice). The whole process does not exceed five minutes to meet patients' needs for a convenient recording. During the weekly family face-to-face sharing process, the family caregiver will calculate the patient's recovery status for a week based on the manual records and input the specific numbers into the app. In the monthly summary, the family caregiver can browse the patient's comprehensive rehabilitation data, and the system will give suggestions based on the monthly patient's record. If the family caregiver performed well, the system will remind the family caregiver to give the appropriate patient rewards.

In the patient's daily social offline peer support section, family caregivers are responsible for recording the patient's daily joyous moments through photographs, videos, etc., and forming an online recovery photo album. The images in the photo album can be freely shared on social medias, and the family caregivers assist to print out the selected photos with the patient and post the selected photos on the rehabilitation manual. Family caregivers can establish different rehabilitation groups on the app communication page, keep in touch with the medical team in anytime and anywhere, and obtain timely news from all stakeholders. Family caregivers can also know about recent offline peer support activities on the event page and share the latest information with patients through face-to-face communication, encouraging patients to develop personal hobbies through related activities.

The following picture shows the patient rehabilitation manual, including the home page, the guideline page, rehabilitation exercise guidance pages, healthy diet guidance pages, daily record pages, and monthly summary pages.

Figure 5.11 The Bcare manual (1)
Source: The author made

Figure 5.12 The Bcare manual (2)
Source: The author made

The following figure shows the main functional interface of Family Caregiver App, including the welcome page, registration page, home page, data input page, etc. The four primary functions of the navigation bar are "Home ", "Supervision", "Moments", and "Community" . "Home" page provides family caregivers with patient rehabilitation guidelines and peer-supported news. Those family caregivers can browse the patient's past rehabilitation records and check phased curve changes in " Supervision"; " Moments " is the patient's personal life image space, and family caregivers record those memorable moments in the recovery process; "Community" includes online group interactions and offline peer support activities.
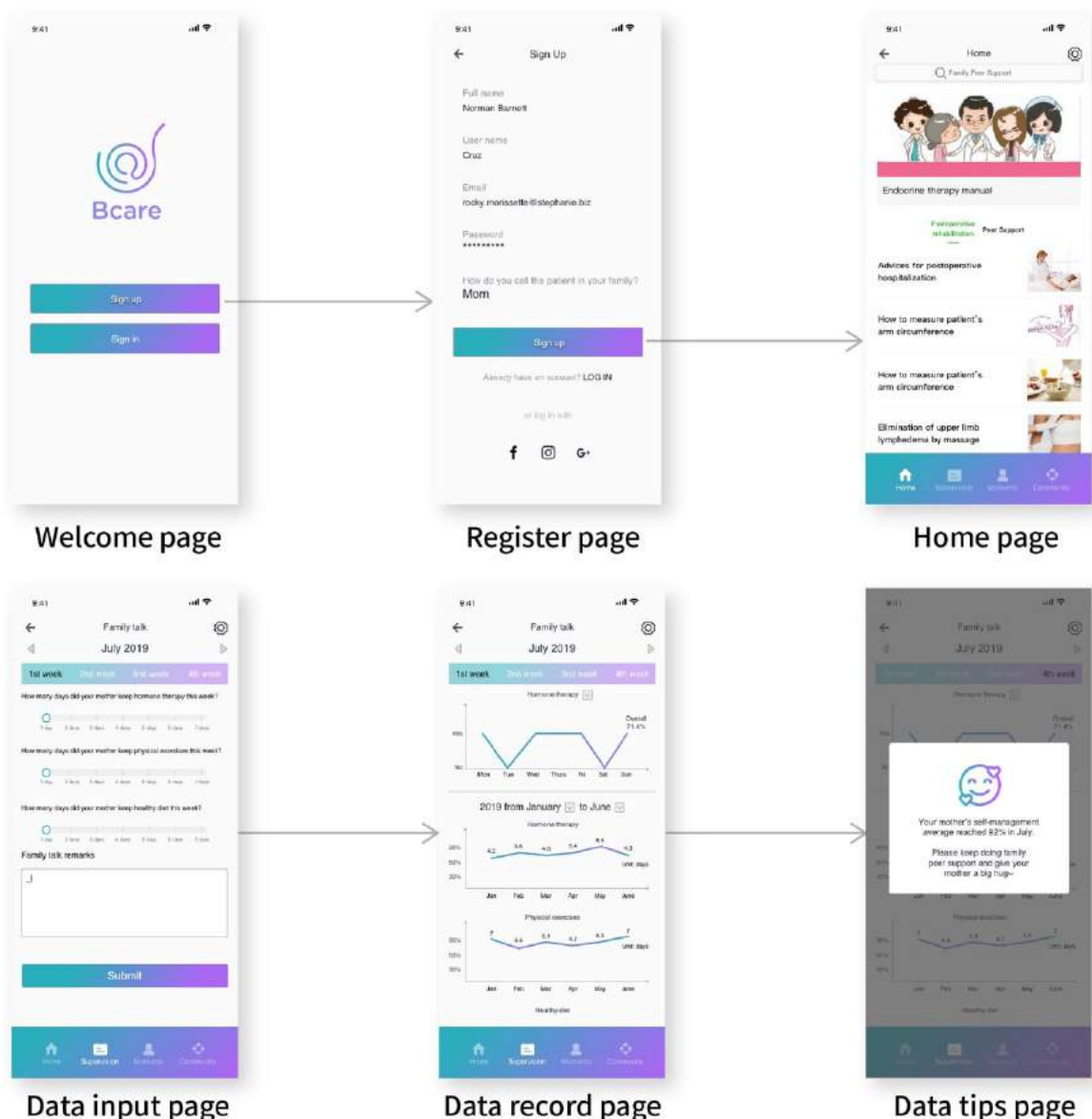
Figure 5.13 The family caregiver UI (1)
Source: The author made
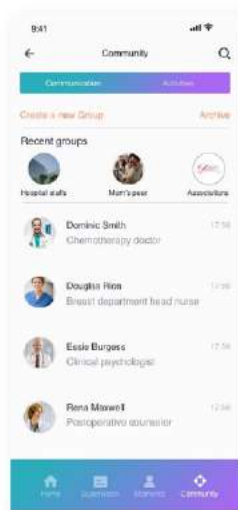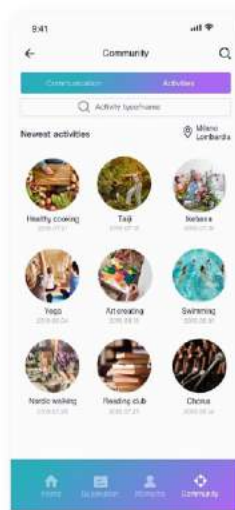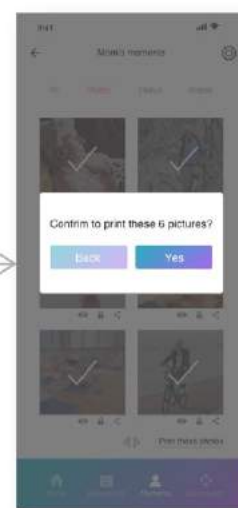
Figure 5.14 The family caregiver UI (2)
Source: The author made

5.1.3 Service system analysis

The following figure is a service system map showing the interaction of material flow and information flow between different stakeholders. In this map, the postoperative patients and the family caregivers are in the central position. The family caregivers transcribe the data to the Bcare online platform and share the data to the medical care when necessary. Relying on the well-developed medical system in Italy, patients can obtain peer support through offline communication and participation in offline activities.

In contrast, family caregivers in the service system supervise patients to complete daily rehabilitation tasks, input patient data, and obtain information from online platforms. After the intervention of Bcare services, the relationship between various stakeholders has become closer. Medical staffs and rehabilitation organization staffs obtain patients rehabilitation data easily to evaluate rehabilitation service quality. Bcare service will drive the overall peer support to undergo a qualitative change and form a good service closed-loop to meet the self-renewable design requirements.
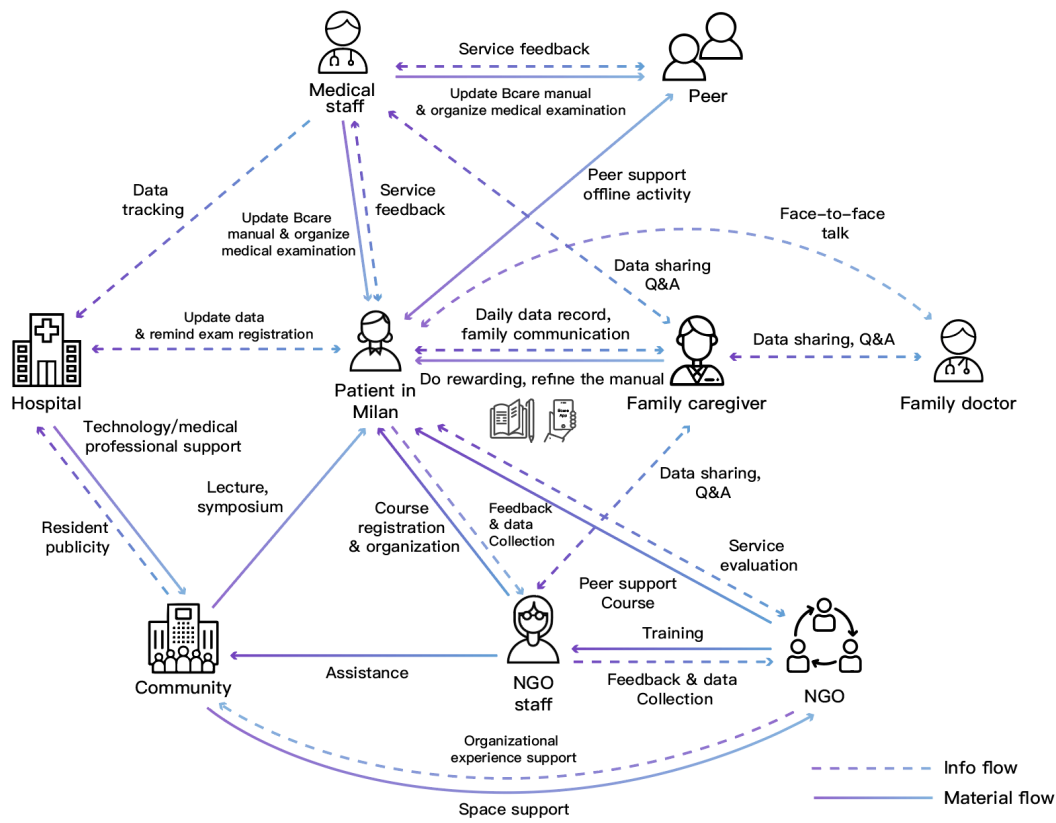
Figure 5.15 The service system map (Milan)
Source: The author made

5.1.4 Service evaluation

In order to evaluate whether the Bcare service indeed improves the quality of postoperative peer support for patients, the author has set up a service evaluation. One postoperative patient, one family caregiver, and one medical staff completed the assessment separately. The specific process of the evaluation: the first step is to complete the questionnaire for the control group (Appendix C); the second step is to understand the specific service process of Bcare through the author's introduction and imagine the usage scenarios in daily life; the third step, complete the questionnaire for the experimental group (Appendix C).

The questionnaires in the control group and the experimental group are the same. The

specific quantification method is to score the satisfaction of the postoperative patients, family caregivers, and medical staffs with the service before using Bcare and after using Bcare. The scoring scenario is the process of taking physical examination in hospitals, participating in the offline activities/lectures in the rehabilitation institutions, the communication and interaction process in the family. From Figure 5.16, it can be seen that postoperative patients, family caregivers, and medical staffs evaluate the quality of peer support has improved by 0 to 2 points after using Bcare service. The total score for the improvement is 14, reflecting that the Bcare service has indeed improved the quality of peer support. It is manifested in the specific scenes of taking medicines/physical examinations in medical institutions after surgery and the communication in the family, especially the acquisition of rehabilitation and health care information have been significantly improved.
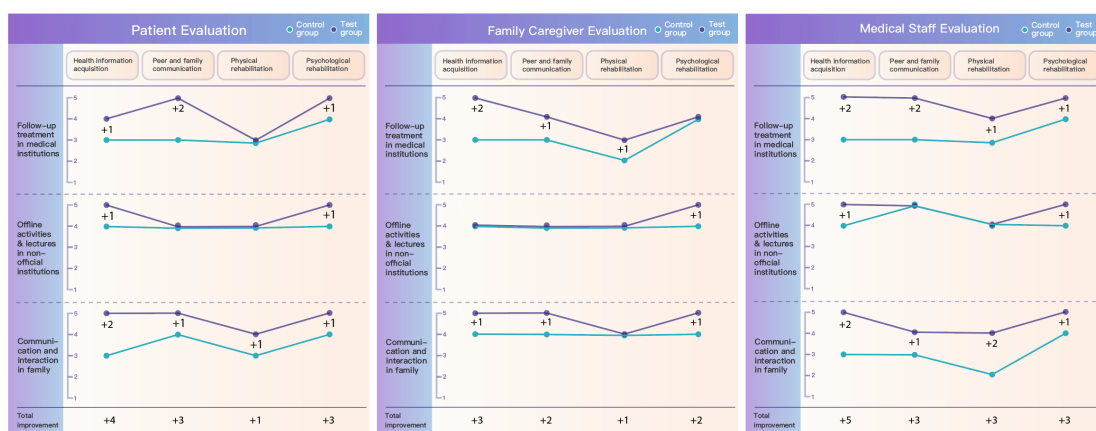
Figure 5.16 The pacing chart evaluation (Milan)
Source: The author made

Postoperative patients, family caregivers, and medical staffs gave specific feedbacks on three stages. The overall feedback was positive, but there were questions about some design details. Postoperative patients raised questions about the evaluation criteria of daily records and asked for the guidance of face-to-face interviews in the family. The inconsistency of the paper record was also a doubt. Family caregivers put forward suggestions for personalizing face-to-face communication time according to different family characteristics and put forward higher requirements for service flexibility. The medical staffs believe that the designer should collaborate with the medical team when updating the service so that the doctor have possibility to maintain consistency with the service during the face-to-face consultation.

| | Pre-Service | | Service | | | Post-Service |
	Service Aware	Service Register	Daily Record	Online Communication	Offline Activity	Service Feedback
Medical staff		1.It's a good time to make service recommendation during physical examinations. 2.The designer should updates the manual tool and communicates with the doctor timely, and the doctor should also cooperate to understand the introduction.	1. When medical staffs obtain patient data, do they need the patients' confirmation? Will it infringe on the privacy of patients? 2. It is necessary to confirm that the patient's daily records are accurate and effective.			When the designer updates the service tool, the new tool should be tested by medical staffs in advance.
Patient	I am happy to use it if the service is free. It is the instinct of every patient to follow the doctor's advice.		1. I like the ticking form, but I need to learn how far I can accomplish the task. 2. I am not sure that my family caregivers can have face-to-face meetings with me every week. Do I need to inform in advance about the topic of the face-to-face meetings or just follow the routine?			What should I do with the previous manual after the updating? I hope to have a long-term view of the recovery data.
Family caregiver	1. I like the customization feature when the patient doing registration. 2. The information service must be from a reliable medical institution, and align in different hospitals.		1. I hope that the family communication can be customized according to situations, because the relationship between different family are varies. 2. Offline activities are opportunities for patients to develop personal hobbies, as well as to promote the memory creation among family members.			Will the Bcare app be updated simultaneously when the manual is updated?

Figure 5.17 The evaluation feedback (Milan)

Source: The author made

5.2 The adaptability of the design outcome in Shanghai

5.2.1 Background of the adaptive exploration

The innovation of rehabilitation service after breast cancer surgery is a topic of concern worldwide. Because breast cancer disease itself is closely related to social privacy, such as sex, fertility, family relations, and so on, peer support have diversity in different cultural contexts. Data from the International Journal of Clinical Breast Cancer shows significant divergences in treatment models, care service quality, and patient prognosis among countries. The impact of postoperative rehabilitation strategies used in different countries on patients' quality of life is unknown. Under such circumstances, the strategy of peer support services after breast cancer surgery lacks international norms, and a large number of local cases are needed to supplement data [55].

Therefore, when designing peer support services, designers have to keep a more open mind and dialectically look at the reality of "unacceptable" in cross-regional applications. Neena Gupta-Biener pointed out that responding to service design challenges in a multicultural world in the healthcare field requires respecting the original product usage habits of different cultural backgrounds, and keep simplifying the design, making the process popular, and solving the most pressing common problems. She demonstrated the process of cross-cultural design by enumerating the adaptive design cases of Austrian local pregnant women and Eastern European immigrant pregnant women using the same pregnancy nutrition search app and emphasized that visual stories can be used as a new communication tool under the premise of different languages and cultures[56]. In the book "Managing Complexity and

Innovation through Design", Satu Miettinen proposed that design innovation can only be built on the interactive touchpoints of the user's original life trajectory to allow the design to have a sustainable development space. It should be more critical in cross-social cultural service design by following this principle [57].

5.2.2 Difficulties and breakthrough in improving the adaptability

From the analysis of the adaptability background, it can be seen that in order to make the design produced in Milan develop more implementation value. The designer's adjustment of the scheme needs first to clarify the interactive touchpoints and life trajectories supported by the further interview.

Chapters 3 and 4 of the previous statement dealt with the social environment in Milan and Shanghai. From the in-depth study of the medical system and postoperative patient support activities, the author found that although patients in the two cities have certain similarities in their peer support needs, but the channels for obtaining peer support are different.

The specific needs of patients in the two places can be summarized in following directions: healthy diet guidance, rehabilitation exercise guidance, peer social activities, physical examination registration, companionship with family and friends, rehabilitation information subscription, timely communication with doctors.

The difficulty of the adaptive adjustment is that the designer have to explain the initial design for local patients in Shanghai through a more easy-to-understand storytelling way. Then, the author collect the local patient feedbacks in details of the whole service process in time, classifies and summarized feedbacks that could promote the design while using visual tools to determine the commonality difference.

The breakthrough point of the adaptive adjustment of the plan is to consider how to use the existing resources of Shanghai to carry out the innovative integration of service touchpoints from the perspective of service innovation, and conduct evaluation of innovative plans to explore and design future development direction.

5.2.3 Redesign according to adaptive exploration insights

(1) Task description

To better tell local patients the service story, the author visualized the service process produced in Milan, and told the local postoperative patients and family caregivers in the form of visual storyboards. The service story has seven acts, which were *get in the service*, *follow the guidance*, *weekly data collection*, *precious moment record*, *offline activity*, *monthly summary and reward*, and *memory collection*.

The first act: the Bcare service is introduced to the patient from the doctor, and the patient begins to explore how to use it with her family; **The second act:** the patient uses the Bcare

manual to record the medication, diet, and exercise status in every day; ***The third act:*** the family caregiver has a weekly family meeting to input the patient data into the App, she confirms that "Supervision" section aims to form the patient's rehabilitation database; ***The fourth act:*** the family caregiver take photos and videos about patients daily rehabilitation moments and do record in the "Moments" section; ***The fifth act:*** the family caregiver shows interesting events to the patient, and do record in the "Moments" section during the offline activity; ***The sixth act:*** the family caregiver learns the patient record data of the month on the App. If the patient performs well, the family caregiver should reward the patient in a pleasant way; ***The seventh act:*** the patient and the caregiver select and print photos in the "Moments" section jointly, and paste them into the corresponding area on the Bcare manual.

The author collected, sorted and analyzed all feedbacks, and established the new understanding through visual stories. In addition to storytelling, the author designed a functional priority test, including healthy diet recommendations, rehabilitation exercise guidance, patient social activities, physical examination reminders, the companionship of relatives and friends, rehabilitation information subscriptions, timely communication with doctors, and receiving gifts and surprises. The interviewees were also asked to select three items and then prioritize the functions according to their choices, Finally, the author achieved the purpose of clarifying the difference in functional needs of patients in the two cities.
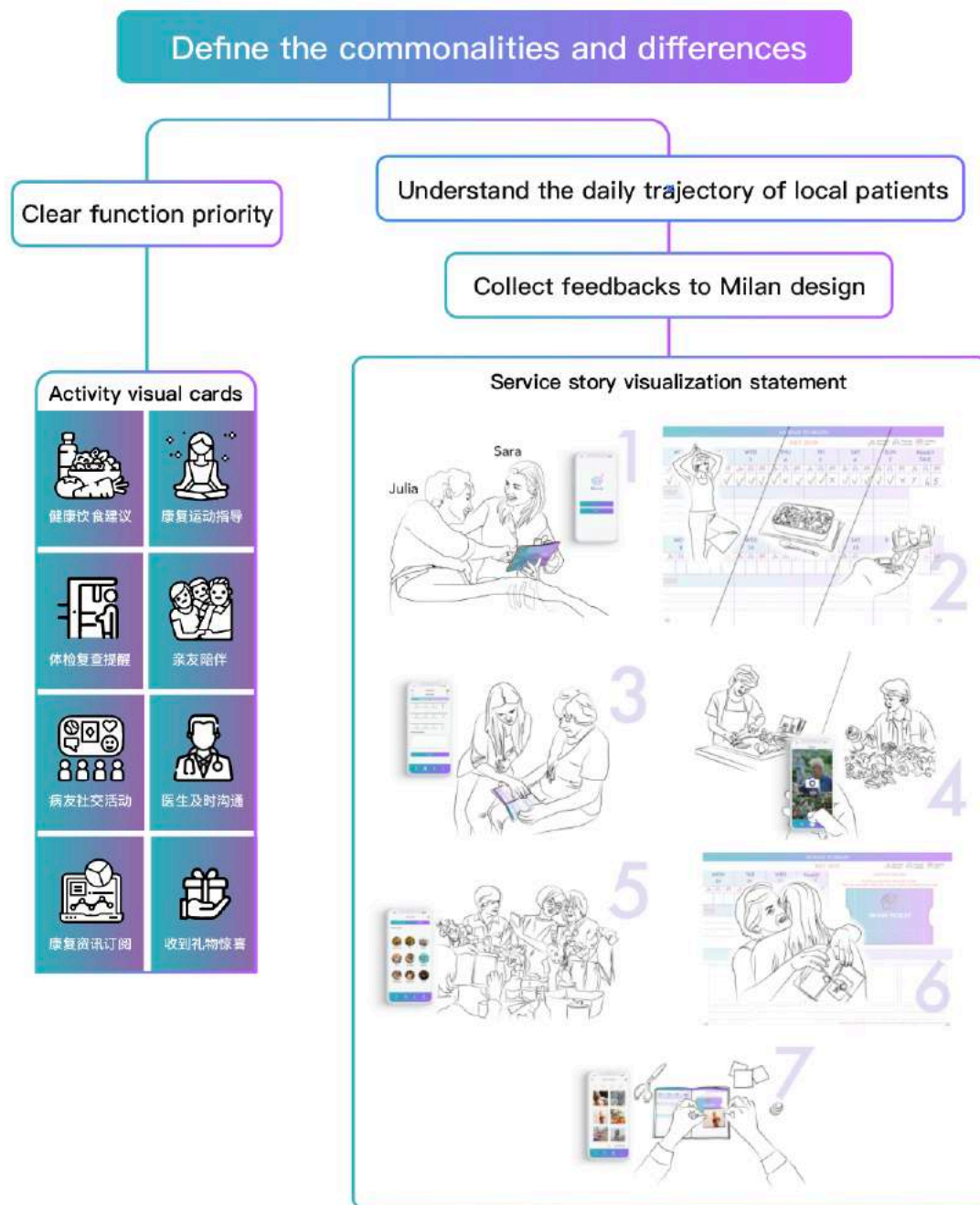
Figure 5.18 The adaptability test tool
Source: The author made

(2) Program adaptability adjustment process and related insights

Time: 2019/12/11 (10:00am-12:30am)

Venue: Department of Breast, Antu Branch, Yangpu Central Hospital

Participants: Three middle-aged postoperative patients (labeled as patients 1, 2, and 3 respectively), three elderly postoperative patients (labeled as patients 4, 5, and 6 respectively), six patients, two family caregivers and one interviewer (author)

• Research process

The author told service stories to six patients, several family caregivers, and doctors, collected feedback from interviewees by telling the seven-act service process, and organized them on the service storyboard.

Figure 5.19 Service storytelling

Interviewees used the different colored squares provided by the author to fill in their opinions. The green squares were from middle-aged postoperative patients, the red squares were from elderly postoperative patients, the orange squares were from family caregivers, and the purple squares were from doctors. Based on the views of different stakeholders, the author had a more comprehensive understanding of the key points of design adaptability.
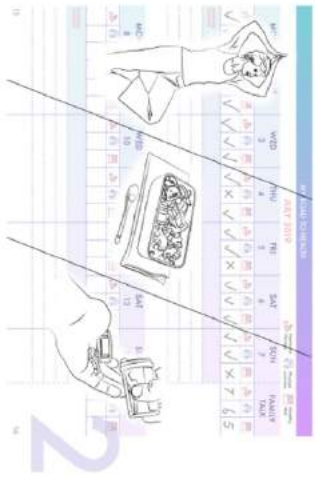
Figure 5.20 Service storytelling feedback (1)
Source: The author made

第三幕：一周一会

3

医生：
对于病理数据记录要保持隐私性。病友之间的互相交流需要引导，万一有病友去世的消息可能会带来负面影响。

1号患者：
数据记录的意义在于给病人提供建议、调整目标。如果病人接受高昂至可以用线上打卡的方法。录人的数据范围可以再广一些，还需要做什么计划。

家庭照顾者s：
数据digitalize是必要的。心率、血压、睡眠质量之类的结合手机或家可穿戴设备。基础数据的输出可以直接带助病人做判断，让病人知道该怎么调整自己的生活状态。

4号患者：
国情不同，很多家庭异地分居，时间上也难以配合。

app在数据里可视化的层面要尽可能简化和直观，医生这一方看到的病人数据监测界面也需要设计。

第四幕：美好瞬间

4

3号患者：
我本人就很喜欢种花，能把植物生长过程记录下来挺不错的。

Figure 5.21 Service storytelling feedback (2)
Source: The author made

第五幕：社交活动

第六幕：每月总结

5

6

医生：
我们医院就有这样的病友活动，依康俱乐部。每年6月份会有不同的医生给病人讲课。针对确诊后的患者病群体，由主诊医生推荐病人参加，如果病状况严重的患者们会推荐到的心理科室。

2号患者：
病友之间讨论能够彼此一些正能量，无论是线上和线下都需要的。

6号患者：
喜欢唱歌，倾向于用自己原有的线上歌曲转来转去有点麻烦。

1号患者：
户外活动，和家人的陪伴都可以是奖励，主要目的是让我放松。

4号患者：
如果是自发的活动因为没有专业人员的指导氛围比较难营造，如果有居委会的介入会更顺利。

家庭照顾者s：
希望能提前了解不同课程对应的参与人员，课程介绍，适宜人群，并给出个性化推荐。

3号患者：
家属认为奖励都是要根据病人兴趣来定，病人喜欢旅游，养花，可以送花的种子。

家庭照顾者s：
病人和照顾者的互动方式，可是会试多种形式。实体的用不不方便携带，奖励机制可以更加开放。病人可以选择更实际的超市优惠券，体检优惠券之类的，也可以选择和家人出游，病人对自己患有慢病有愧疚心理，如果家属人能通过自己的坚持和努力去换眼美品和家人分享，相信会有激励作用。

6号患者照顾者：
报名老年团一日游，出去吃饭逛街。留意平时亲人暗示性的话

Figure 5.22 Service storytelling feedback (3)
Source: The author made

服 务 故 事

第七幕：收获回忆

7

2号患者：
平时基本不发朋友圈，
希望大家在朋友圈里传播
正能量，但是不要外传，
毕竟病史不方便外泄。

家庭照顾者s：
打印目前贴的形式不太适合
懒人，而且不是每一个病人
都愿意回忆起跟随的恢复
过程，这个功能可以作为一
个开放的选择。

其 他 建 议

2号患者：
引障碍的病人年龄跨度很大，要让
设计尽显简单化，来顾老年群体。
病人心理上的排痛孤与和亲人的沟
通也需要有对应的功能来强化。

4号患者：
每个家庭的情况不一样，
子女分居，孤寡老人，空巢
老人博群体都更要考虑。
最好由社区组织来协助，比
如居委会就是能集中社区居
民的广泛分布的组织。

Figure 5.23 Service storytelling feedback (4)
Source: The author made

After completing the service storytelling session, the author invited 6 interviewed patients to select 3 of the 8 functional priority test cards that could best meet their needs, and made statistics.

Figure 5.24 The function priority test

Each of the 6 patients has 3 votes, and the total number of valid votes was 18. The function priority test results: timely communication with doctors 6; healthy diet recommendations 5; physical examination reminders 3; peer social activities 2; the companionship of family and friends 1; rehabilitation exercise guidance 1.

• **Research summary**

From the above service storytelling feedback collection and function priority test results, the following insights of patients in the two places were summarized:

Commonalities:
(1) Patients and stakeholders attach great importance to the doctor-patient communication part in the rehabilitation process. They all hope to obtain online Q&A from medical staffs in a timely and efficient manner and receive appointment information promptly reminder such as physical examinations and medicine collection.
(2) Patients have a higher demand for a healthy diet and knowledge guidance on rehabilitation exercises.
(3) Patients believe that family's and friends' companionship is an important part of psychological rehabilitation support.
(4) Patients believe that offline social activities should be selected based on the patients' personal interests and hobbies.

Differences:
(1) Compared with Milan patients, Shanghai patients are more inclined to use online platforms to complete daily records. They hope to build the service on the platform that is frequently used daily, such as WeChat. At the same time, they care about the online personal privacy.
(2) Shanghai patients believe that it is the patient's responsibility to complete the rehabilitation record every day and there is no need for the family rewards, and convince that companionship is the most crucial part.

5.2.4 Comparison of service process design between two cities

Based on the specific process of adaptive innovation, the author redesigned the Milan output. In view of insights of the differences, the author did adjustment in two aspects.

The first aspect is the daily record tool for patients. Compared with the Bcare service designed and produced in Milan, the daily record platform for local Shanghai patients is the WeChat applet. The patient's WeChat mini program and the family caregiver's App set up an associated account. The family caregiver can remind the patient's appointments such as physical examination and consultation in real-time and know the patient's daily check-in status in the "supervision" function. It can improve the efficiency of family peer support. On the other hand, the attending physician can also easily access the patient's data on the system.

The second aspect is the interaction mode between patients and peers. Since the localized Bcare service patient terminal is built on the WeChat, patients have more opportunities to interact with patients online and efficiently in real-time. Patients can invite peers to join during the online daily check-in, which enhancing continuous motivation and the peer supervision. The figure below shows the user journey redesigned according to the characteristics of Shanghai patients.
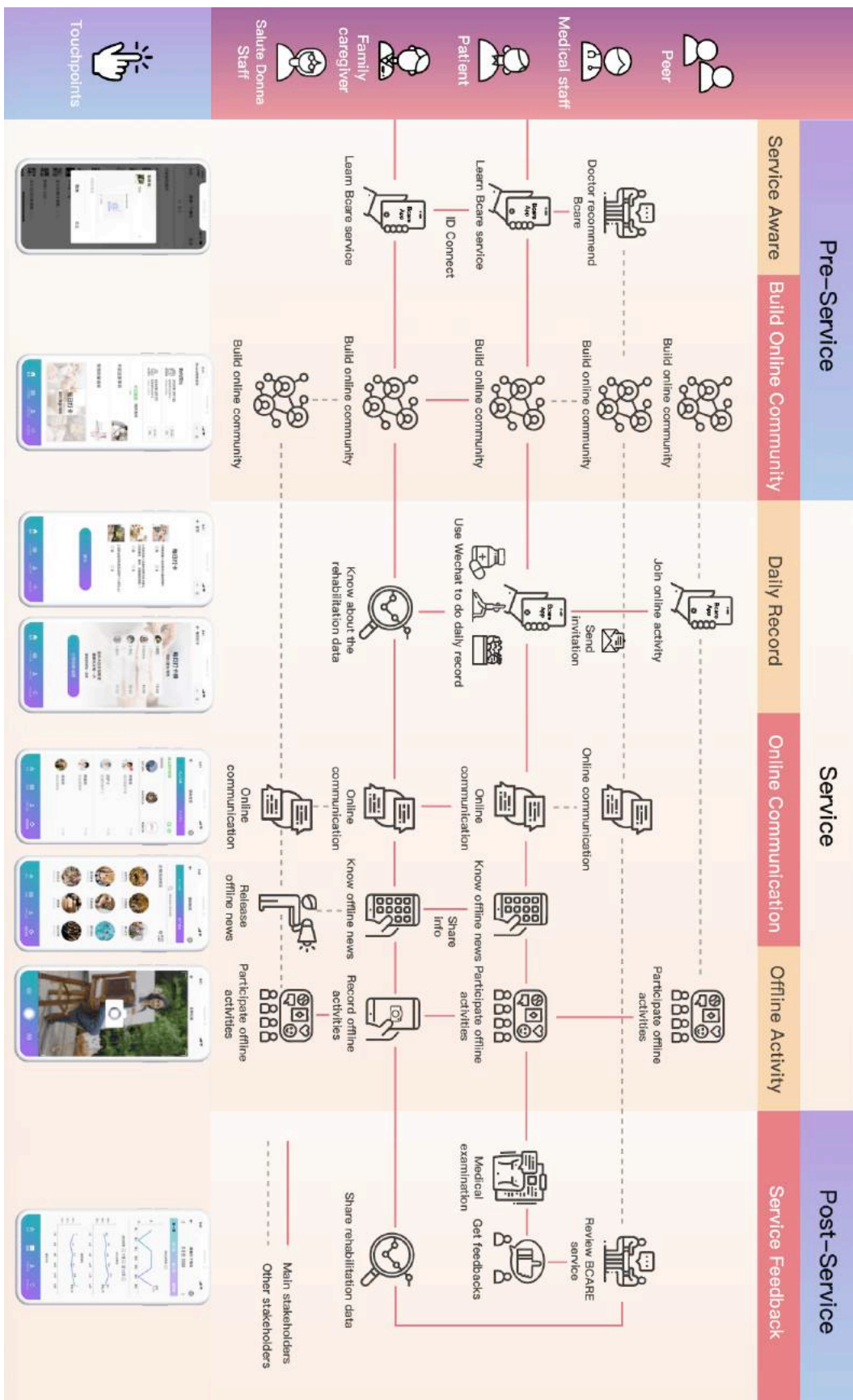
Figure 5.25 The service journey

Source: The author made

Figure 5.26 is the interfaces of the postoperative patient Wechat mini program and Figure 5.27 is the interfaces of the family caregiver App. The function navigation bar at the bottom of the mini program page for patients after the operation is "Home", "Check-in Data", "Daily Record", and "Community". Patients can quickly confirm the appointment time for face-to-face consultation in the "My Appointment" section on the homepage and make online modifications according to their needs. After entering the "Daily Check-In" section, the patient can check-in three aspects: medication, diet, and exercise.

After the daily check-in is done successfully, the patient may instantly check the check-in list of the day, share the list to the peer group, and invite more peers to join. Adaptive solution of the family caregiver app is almost the same as the Milan design. The only difference is that the family caregiver's information in the "Patient Appointment" section at the top of the App homepage is synchronized with the patient's applet, and the family caregiver will be reminded when the patient has medical reservations, corresponding to the critical requirements in the functional priority test.
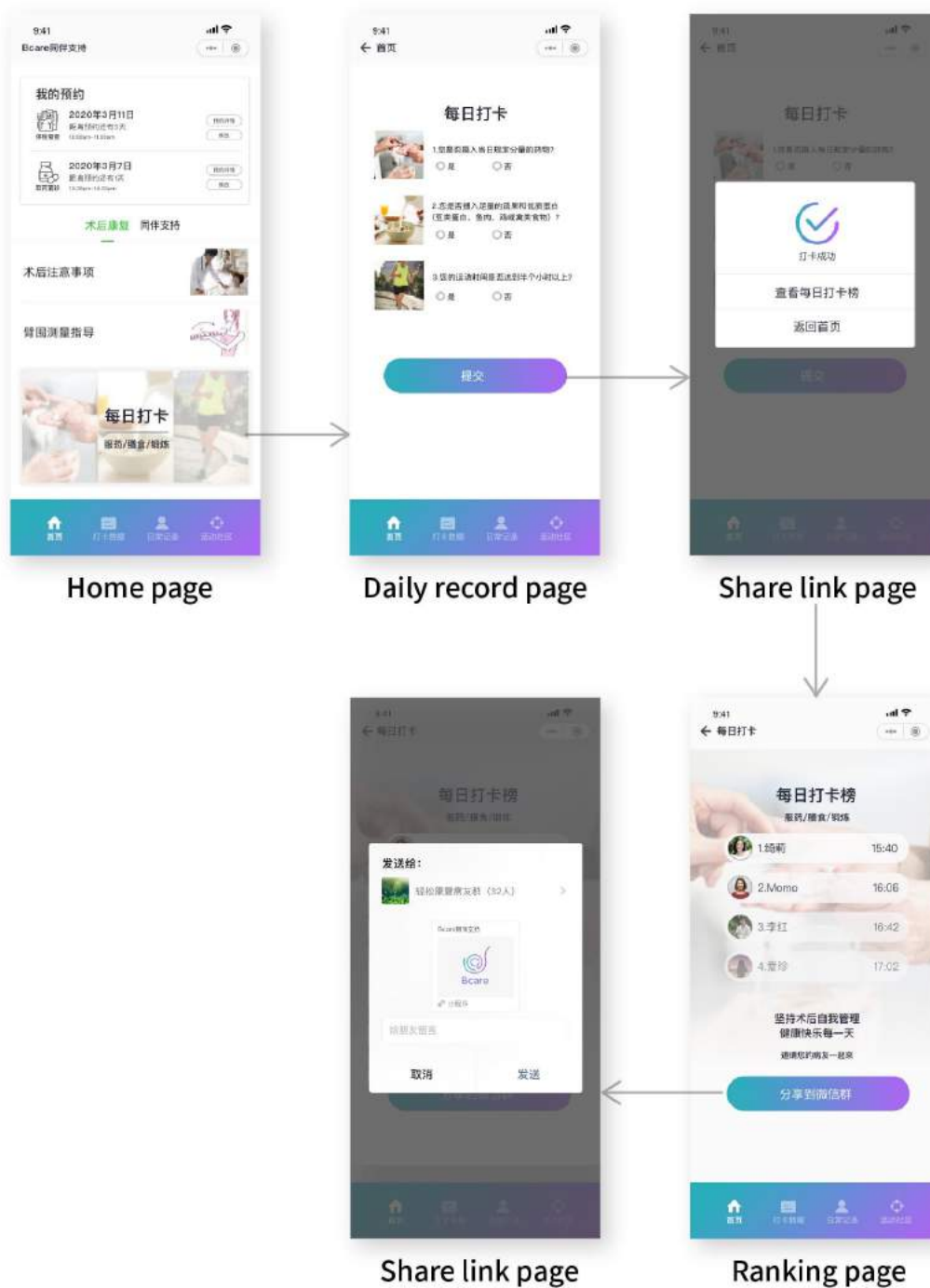
Figure 5.26 The Wechat mini program for patients
Source: The author made
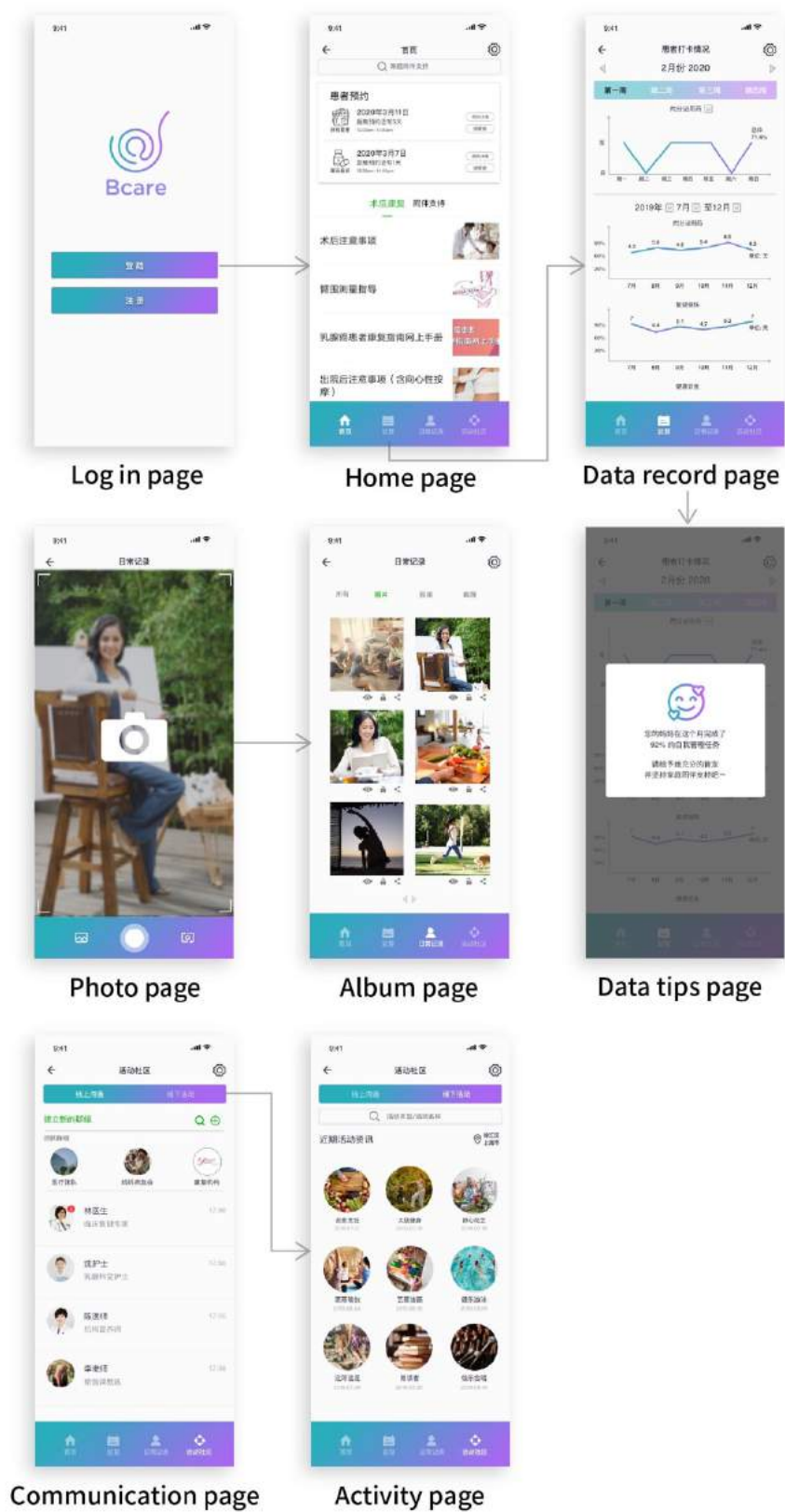
Figure 5.27 The family caregiver UI

Source: The author made

5.2.5 Comparison of service systems between two cities

The following figure is a service system map showing the interaction of material flow and information flow between different stakeholders. In this map, postoperative patients and family caregivers are at the center. Compared with the Milan service system, Shanghai patients record data on WeChat, and the role of family caregivers' data transcription has changed. Patients master all the initiative and forward data to communicate with medical staffs when necessary. The offline peer support of patients in Shanghai is in its infancy, and the form of online patient interaction can make up for the insufficiency of the offline medical system to a certain extent. Family caregivers in the service system also supervise patients to complete daily rehabilitation tasks, and remind patients to complete face-to-face consultation online at the same time. After the Bcare service is adopted in Shanghai, the flow of information is more efficient, and the relationship between various stakeholders is closer. Medical staffs and NGO staffs can continue to obtain patient rehabilitation data to evaluate the quality of rehabilitation services, which is organically fit to China's highly digital medical system.
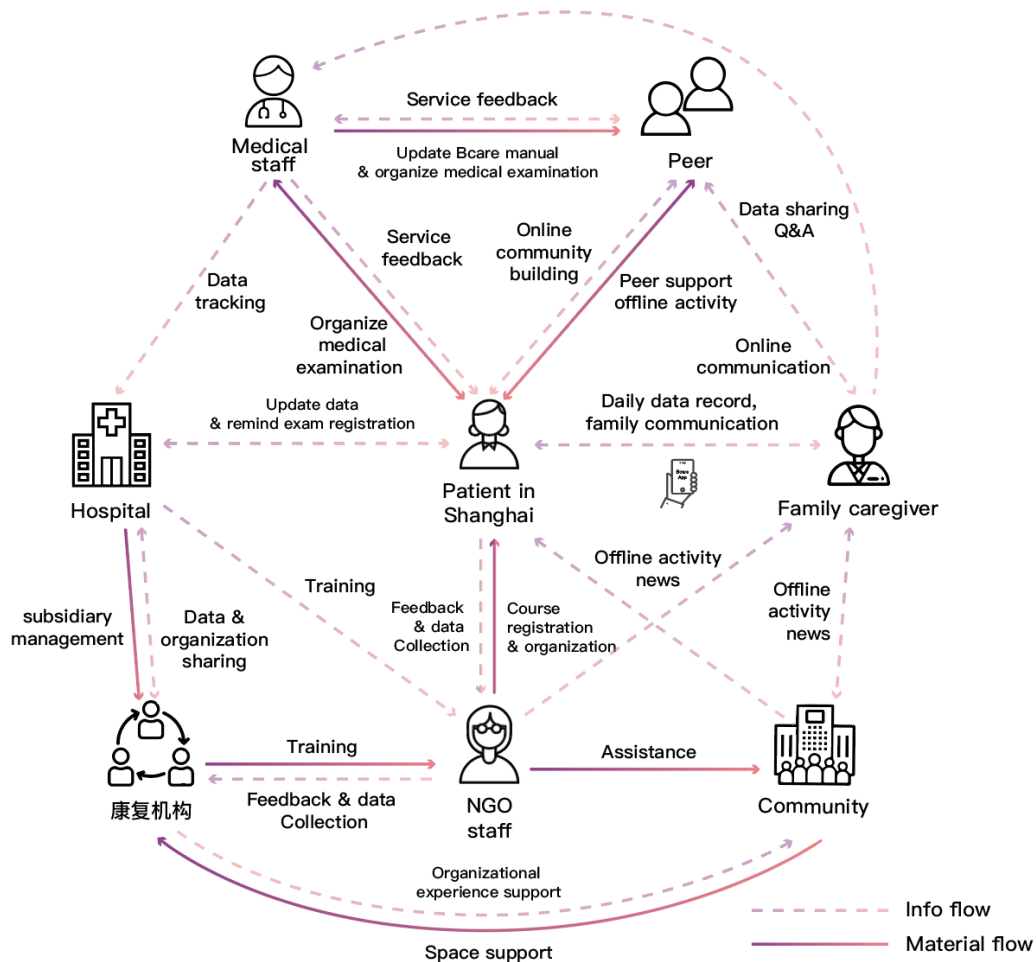
Figure 5.28 The service system map (Shanghai)

Source: The author made

5.2.6 Service evaluation

Same as 5.1.4 service evaluation, 1 postoperative patient, 1 family caregiver, and 1 medical staff completed the evaluation separately. The specific process of the evaluation was as follows: 1. Complete the questionnaire for the control group (Appendix C); 2. Understand the specific service process of Bcare through the author's introduction, and imagine the usage scenarios in daily life; 3. Complete the questionnaire for the experimental group (Appendix C).

It can be seen from Figure 5.29 that postoperative patients, family caregivers, and medical staff generally agreed that the quality of peer support has improved by 0 to 3 points after using Bcare services. The total score for the improvement of medical institutions' postoperative medicine/physical examination process was 12, the total score for the improvement of offline activities/lecture process of rehabilitation institutions was 9, and the total score for the improvement of family internal communication and interaction process was 16, reflecting that Bcare service quality have indeed improved. It is prominently manifested in the performance of the service evaluation data of the two places is positive, and the effectiveness of the two versions were proved .
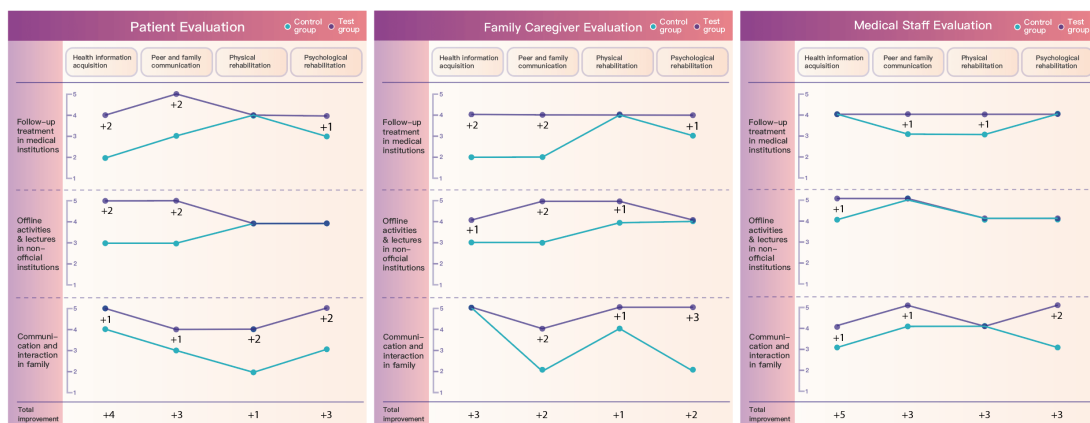

Figure 5.29 The pacing chart evaluation (Shanghai)

Source: The author made

Figure 5.30 Doctor service evaluation   Figure 5.31 Patient service evaluation

Postoperative patients, family caregivers, and medical staffs gave specific feedbacks on the service's three stages. The overall feedback was cheerful, and some of the operational experience needed to be optimized. Postoperative patients proposed the rankings as an incentive form to reduce the burden and increase the function of remote face-to-face consultation. Family caregivers were concerned about the privacy of patient data and reminded the promotes service updates. Medical staffs suggested that the interactive form of the patient's check-in can be combined with the patient's social sharing habits, and the content of the communication with doctors could be incorporated into the digital profile.

	Pre–Service		Service			Post–Service
	Service Aware	Build Online Community	Daily Record	Online Communication	Offline Activity	Service Feedback
Medical staff	This service is very innovative and convenient for patients. The original WeChat patient group can be empowered.		I suggest that the daily check could be more interesting in addition to the basic part. Our patients here usually like to post sports, diet, and personal hobbies related content in the WeChat groups.			The usual online communication can be pickedup to the digital medical record if it is related to the medical condition.
Patient	The Wechat mini programs is very commonly used and very suitable for my needs.		1. There will be a psychology of comparison when checking the rankings. It would be better to use another way for encouragement without additional pressure. 2. After seeing the personal data record, I hope that there will be suggestions to tell me how to improve the rehabilitation effect.			A page dedicated to remote face-to-face consultation with doctors should be included in the app.
Family caregiver	Will this service cause privacy and security issues?		1. This function is very practical to check the physical examination appointment. 2. Does the family caregiver need to keep in touch with the doctor if the patient is able to communicate by himself in a more direct way?			Will sharing of data with doctors have an impact on rehabilitation planning?"

Figure 5.32 The evaluation feedback (Shanghai)

Source: The author made

Chapter 6 Conclusion

6.1 The adaptability of peer support under different social medical systems

From the content of the author's preliminary research and in-depth research in Chapters 3 and 4, it can be seen that peer support has different manifestations in different social environments and medical systems, and there is no difference in specific forms between good and bad. Designers of peer support service need to integrate local social resources, medical resources, and design resources, focus on local real needs and maximize peer support activities' benefits.

In Milan, due to the well-developed rehabilitation institutions, comprehensive and diverse forms of rehabilitation courses, and intellectual support from medical institutions, patients have cultivated a standardized peer support concept when participating in activities organized by rehabilitation institutions. The majority of rehabilitation recording media are traditional paper-based, and the peer support tends to be face-to-face peer communication. Therefore, the author fully considers the inertia of using peer support tools for patients under Milan's social medical system when carrying out peer support innovations.

In Shanghai, the rapid development of the Internet and the high popularity of different age levels have formed a completely different social pattern. The extreme shortage of medical resources has spawned a variety of online platforms for registration and consultation. Patients and their peer supporters need to make full use of the online convenience and real-time nature as peer support in the postoperative rehabilitation treatment for high efficiency. In recent years, peer support activities in hospital-affiliated rehabilitation institutions have begun to sprout, and leading platforms have even begun to use live broadcasts, online courses, and other online medias to benefit a broader range of postoperative patients. Based on this development trend, the author redesigned localized peer support service.

It can be seen that the adaptation of peer support under different social medical systems should be adapted to local conditions, and a practical innovation should be carried out on the premise of a full understanding of the local peer support structure.

6.2 Adaptive innovation strategies for target groups with different cultural backgrounds

When facing target groups with different cultural backgrounds, designers have to think deeply about the internal reasons why different target groups have such emotional expressions for the same event and look for solutions to meet the target group's needs from the internal factors. Intrinsic reasons include many aspects, such as the cultural context, educational background, growth environment, and interpersonal social network, government and public institution participation forms, etc.

The social and family culture affects the feasibility of the design plan. In the design case in Milan, the postoperative patients proactively imagined the reward content, which reflected the rewards and incentives culture within the European social family. All stakeholders agreed that patients should be rewarded when the individual performs well. In the adaptive design, the author found that Shanghai patients felt more guilty because they were sick. Most patients expressed doubts when they heard that patients with good performance could receive rewards from family caregivers. The treatment of illness has increased the family's burden and should no longer be extravagant for rewards. This situation is related to the need for the elders in East Asian cultural families to sacrifice for the family and carry spiritual responsibilities due to parenting responsibilities.

Data privacy sensitivity affects the application medium of the design. In Milan, most of the rehabilitation records that patients encounter after surgery are traditional paper-based. When any institution needs to call the patient's personal information, it needs to ask the patient for consent in a formal written contract. This social living environment has cultivated the patient's awareness of confidentiality. In Shanghai, the speed of Internet technology is changing with each passing day, and the information of various online platforms is interconnected which brings the convenience and efficiency. Before using Internet products, most users lack personal information confidentiality ideas, even for now many users are in the dilemma between the efficient operation and information confidentiality. Therefore, the author makes full use of the internet inertia when doing an adaptive redesign.

In general, the localization of design is based on a comprehensive understanding of the target group characteristics, local cultural background, and social norms. Designers need to maintain a keenness to tap the target group's inherent needs and make reasonable decisions based on the locally available resources.

6.3 Future study

This study mainly focused on the in-depth study of the differences in the social environment and medical system in Milan and Shanghai, and designed according to patients' needs after surgery in the two cities. After the service evaluation, the author made a design validity demonstration, but due to the project's limited duration, the author did not make the next design iteration orientation on the specific performance of the evaluation data. In the future, a further in-depth exploration of the following aspects is required:

The process guidelines for the family sharing session of the Milan design lacks a specific design for face-to-face communication between patients and family caregivers. What principles should family caregivers follow to transcribe patient data? What questions should family caregivers use to understand the patient's recent recovery and respond to patients' answers. The positive motivational effects that need to be studied by designers are also the real needs of patients and family caregivers.

The information integration and publishing for offline peer support activities in Shanghai rely on the hospital-affiliated rehabilitation institutions. However, different medical institutions have different information channels. Bcare offline activities section is supposed to integrate each medical institution's platform information resources in the future. In that case, the system will make a classified display, which builds a synthesized platform for communication between different medical institutions and ethnic groups. It helps with combining medical staffs feedbacks on incorporating online medical consultations into digital medical records, opening up information channels between hospitals and bringing greater social value.

On the whole, patients after breast cancer have always needed emotional and information support during the long rehabilitation process. As an essential way to meet both needs at the same time, peer support should be continued and adjusted according to the different stages of the patient's recovery. The design of peer support services matches the development of the medical system, and the collaboration of all stakeholders can promote a more profound and informative innovation in the patient's family and even the patient's medical rehabilitation system.

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Appendix

Appendix A Preliminary Investigation of Peer Support after Breast Cancer Operation

Milan Salute Donna Institutional Research

Time: 2019/2/20 (10:30am-12:30am, interview time 1h)

Location: Salute Donna Administrative Office

Participants: Manager of office administration, the author

Interview format: structured interview

• Question structure

Basic information and job description
1. How long have you been working in the organization? What are your daily duties?
2. What is the current operation of the organization?
3. What is the most difficult part of the job for you?

Course operation and peer support content
1. Can you briefly introduce some postoperative rehabilitation courses for breast cancer patients?
2. What is the current situation of patients participating in courses?
3. How can I become a volunteer for the event?
4. How do breast cancer patients sign up for the event?
5. What is the performance of breast cancer patients when participating in the event? How did they achieve peer support?
6. How does your institution evaluate and quantify the positive impact of courses on patient healing?
7. What do you think needs to be improved in the current activities?

Open questions about postoperative rehabilitation
1. What do you think is the focus of recovery after breast cancer surgery?
2. What support do you think family and friends of breast cancer patients should provide?
3. Do you think the current local social environment can provide enough support for

patients after breast cancer surgery? why?

• **Feedback organization**

Basic information and job description
1.She has been working for 24 years, mainly responsible for the office's administrative management, coordinating various departments' operations.   2. The organization is now running well, private companies and social donations mainly support the funding, and the income from the Cascina Rosa cooking class is composed of three parts. The business covers the whole country from north to south. Now the southern Sicilia region is preparing to build a new business site and has also held public welfare activities in Serbia. Every year, the organization organizes the various activities of the year into an annual report. In the 2017 annual report, you can see the cooperation data with different organizations and reports on successful activities.   3. The most difficult thing is communicating with the doctor because the doctor is too busy to make an appointment for the meeting. In many cases, the work needs to be adjusted according to the doctor's schedule.

Course operation and peer support content
1. Cascina Rosa and Nordic Walking are for society, advocating a healthy lifestyle and teaching through a professional team held three times a month on average. Moira is only open to patients, ten times a week, through group communication and yoga to help patients recover. Cascina Rosa is 55 Euros for one class and 165 Euros for three classes. The cost includes the ingredients and utensils provided in the class. Moira, Nordic Walking is free. If you want to participate in the Moira course, you need to get the doctor's consent because it involves the patient's treatment and privacy and language issues, and an Italian translation is required.   2. Cascina Rosa, Moira, Nordic Walking have many patients participating. 100% of Moira are breast cancer patients, and all of them are currently women. The other two activities are for men and women, as well as people of all ages.   3. Everyone is welcome to sign up as a volunteer. The volunteer will first have to do an

assessment, and the psychologist will analyze whether she/he is suitable for volunteer work, and then go through 6 months of training, management of learning activities, and communication skills with patients, So you can become a qualified volunteer.

4. Many patients participate in the activities by introducing their patients because they like this informal group activity. At present, they are all residents, and telephone registration is the most common way. It is difficult for foreigners to use the Italian service hotline.

5. They will feel shy initially, but gradually they will adapt to the activity's rhythm, become friends, and communicate in private. Of course, it is essential. The patients are people who can truly understand them. The patients' family members are very busy and cannot fully appreciate the pain of the disease. The patients play a crucial role for them.

6. Mainly through patient questionnaire feedback and doctor's professional evaluation. Doctors will evaluate each quarter through professional psychological evaluation data, quote the patient's words, organize them into ppt reports and discuss them in internal meetings. These materials cannot be leaked because they involve the privacy of patients.

7. Extend the activity cycle, not the frequency but the continuity of the entire activity. This is also the activity innovation being implemented in 2019. It is not easy to make patients more interested and to participate uninterruptedly. Only continuous treatment can achieve the effect.

Open questions about postoperative rehabilitation

1. Don't be afraid. In addition to receiving hospital treatment, you should also pay attention to your mental health, cultivate your hobbies, and do things that make you happy.

2. Listen and accompany. After the patient has participated in the activity, communicating with family and friends can encourage the patient's positive development, and sharing the discoveries in the activity can also create more topics.

3. Many women's health institutions in Italy are paying attention to cancer patients, and there are also many related short-term activities, but society has not formed a mechanism. The government has not increased medical investment in women's cancer diseases. Therefore, we have set up a special consultation counter at the IRCC Fund Research Institute to help patients find us better.

Investigation of Shanghai Yangpu District Central Hospital

Time: 2019/11/29 (11:30am–14:30pm, interview time 20mins)

Venue: Shanghai Yangpu District Central Hospital

Participants: Deputy Chief Physician, the author

Interview format: structured interview

• **Question structure**

Basic job description
1. What is your position?   2. Are you busy at work? When is the peak period? why?
Patient follow-up and peer support
1. Regarding the postoperative follow-up physical examination, what is the patient's performance?   2. Will the patient or her/his guardian take the initiative to contact you? What is the frequency? What is the content of the communication?   3. What kind of peer support is currently provided by the hospital for postoperative patients? Do you think there are any shortcomings? Why?   4. From a professional point of view, what do you think patients should pay attention to in their postoperative life?

• **Feedback organization**

Basic job description
1. Deputy Chief Physician   2. Working days are busy, especially when there are operations and outpatient clinics in the morning
Patient follow-up and peer support
1. For physical examination, a physical examination is required every 3 months after 2 years, every six months for 3-5 years, and every year after 5 years. Patients usually come for physical examinations on time, and a small number of them forgot to come for various

reasons or fail to meet the frequency.

2. Generally, patients make appointments online to review their physical examinations. They take endocrine drugs every 3 months. They need to take the drugs for 5-7 years. Most of them are face-to-face communication. Because breast cancer is a disease that needs to be observed for more than 5 years, doctors and patients will establish a relatively long-term relationship, sometimes through WeChat or telephone, and the content of the communication is mainly about the discussion of the disease.

3. The hospital will remind patients of regular physical examinations and medication guidance. Psychological communication needs to be strengthened, especially for targeted counseling based on women's psychological characteristics. The Breast Cancer Psychological Quality Education Research Association, affiliated with Tongji, conducts seminars twice a year.

4. An essential thing is a physical examination and medication. This is the prerequisite for maintaining the effect of the previous treatment, and it is also the part that doctors can directly connect with.

Investigation of Shanghai Breast Cancer Psychological Quality Education Research Association

Time: 2019/10/21 (12:30pm-15:30pm, interview time 40min)

Venue: Shanghai Center for Disease Control and Prevention

Participants: Participant A, Participant B, the author

Interview format: random interview

Interviewee information	
A local resident in Yangpu District, Shanghai, 55 years old, female retired employee	A local resident in Hongkou District, Shanghai, 49 years old, female in-service professor
How did you learn about this lecture?	
The operation was completed at the Shanghai Yangpu District Central Hospital more than a year ago, and the attending	Personally, I pay more attention to various lectures and sharing of breast cancer knowledge. I will participate in online and

doctor recommended the patient to participate in this activity.	offline activities. Professors from the Affiliated Hospital of Tongji University recommend to participate in this activity.

What did you learn during the lecture? Does it meet your expectations and why?	
Generally speaking, I have learned some methods of self-psychological guidance, but the more academic content in the front is more difficult to understand, and it is difficult for the audience below to concentrate. The interactive session is very interesting. You can arrange more exchanges between patients, and you can also talk more about how the patient handles family relations after the operation.	A lot of content has been learned in other lectures or activities. The highlight part of this lecture is to help patients understand their own personality and psychological characteristics and make suggestions, so that patients know which direction to adjust their attitude towards things, and try to develop in a positive direction.

Do you know what peer support is? Do you think it is reflected in this lecture?	
Peer support is roughly the encouragement between patients and between patients and friends. It is biased towards positive psychological communication. Most of the lectures are still explained by experts, and there is not much presentation.	I have read some documents and books related to peer support. Peer support has both psychological and physiological aspects. There are even specialized organizations to offer courses abroad. It is difficult to achieve all-round peer support in China, but family support Part of it can still be learned from foreign countries. This lecture is basically not involved, but more from the patient's own perspective.

Appendix B In-depth investigation of peer support after breast cancer surgery

Milan Moira Companion Support Course Survey

Time: 2019/4/23

Location: Salute Donna Teaching Area

Participants: Middle-aged postoperative patient B, a psychologist, the author

Interview format: unstructured interview

• Middle-aged postoperative patient B

How did you learn about Moira's event? How long have you been participating?
1. After the operation, I was hospitalized for nearly two months. When I was discharged from the hospital, the doctor introduced Salute Donna to the patient.   2. The patient has participated in different activities of the institution. This is the fifth time that the patient has participated in Moira, which has been going on for a month.

What do you think the activity will bring to your recovery? In what way?
1. It is tremendous, which allows the patient to regain confidence from the physical to the psychological.   2. Each class has a different theme. In this class, doctors will analyze video cases to let patients know more about life's precautions.   3. In addition to psychological counseling, in the last class, a yoga instructor led the patient to do stretching exercises to eliminate postoperative lymphedema. Each class will have a different focus.   4. Another hour of psychological mutual assistance communication is a regular session. You can share the progress and troubles in the rehabilitation process, and you can also get a lot of useful suggestions.   5. Patients will also contact them when they are outside the classroom and even organize outing activities. Several participants took their children to a picnic last weekend, and the patient's family also established a good relationship. This is the biggest gain for the patient from the course.

Do you think you can persist in self-management after the course? why?
1. The answer is not sure. The patient learned a lot about self-management methods in a

class, but this is based on regular meetings with peers and doctors every week.

2. Patients try their best to record their status in a notebook every day because patients know that they must share it with everyone in the class. Given the high cost of writing a diary, if no one urges the patient to persevere, it is uncertain.

What is your motivation for self-management if you insist on participating in the course?
1. Through participating in the course, patients feel a lot of care and make new friends. 2. The patient believes that personal progress is the first step. Only when the patient becomes healthy again can he take care of his family and re-work to create value for society.

• **Psychologist**

What do you think are the difficulties for patients in the recovery process?
1. Psychological rehabilitation is more complicated than wound rehabilitation. This is a long and constantly changing process. 2. The patient's family environment and social environment are different, so the doctor's advice will be more specific to personal characteristics. 3. Based on clinical psychology's scientific benchmarks, doctors use the experience-based co-design method to evaluate the personal forms twice a week and give customized suggestions. 4. Doctors encourage patients to take the initiative to create a better family environment. For example, take the initiative to communicate with family members, find family members to accompany them when they are depressed and anxious, and take sharing of the lessons learned each time as homework. It is difficult for doctors to let patients open their hearts to tell their own experiences and naturally establish a network of relationships between patients and peers.

How do you think patients should maintain self-management after the course?
1. As long as a habit is formed, there is no need to deliberately maintain it. This is also the purpose of Moira. A behavior can be repeated for 21 days to form a habit, and the two-month course arrangement has allowed patients to form a self-management concept.

2. Doctors and institutional staff have always encouraged patients to record their progress in the form of diaries and photos to form their own reward mechanism, such as rewarding themselves and their patients for a short trip after completing a month of records, or buying a favorite gift . While self-management, the cooperation of family members is essential. Of course, doctors will also keep in touch with patients.

Appendix C Service Evaluation Questionnaire

Milan Design Evaluation

(1) Questionnaire for the control group: the status of postoperative peer support of patients

Questionnaire publishing platform: Questionnaire Star

Questionnaire link: https://www.wjx.cn/jq/64452342.aspx

Sample currently filled in: 1 postoperative patient, 1 family caregiver, 1 breast clinician

(2) Questionnaire for the experimental group: post-operative peer support of patients after experience design

Questionnaire publishing platform: Questionnaire Star

Questionnaire link: https://www.wjx.cn/jq/64450708.aspx

Sample currently filled in: 1 postoperative patient, 1 family caregiver, 1 breast clinician

Shanghai Design Evaluation

(1) Questionnaire for the control group: the status of postoperative peer support of patients

Questionnaire publishing platform: Questionnaire Star

Questionnaire link: https://www.wjx.cn/jq/61128724.aspx

Sample currently filled in: 1 postoperative patient, 1 family caregiver, 1 breast clinician

(2) Questionnaire for the experimental group: post-operative peer support of patients after experience design

Questionnaire publishing platform: Questionnaire Star

Questionnaire link: https://www.wjx.cn/jq/61152542.aspx
Sample currently filled in: 1 postoperative patient, 1 family caregiver, and breast clinician

Appendix D Graduation Design Exhibition in Tongji University, Shanghai

Thank

When finishing the graduation thesis and research, I would like to express my appreciation to mentor Davide Fassi and Bo Gao. They taught me academical valuable knowledge and led me to social innovation practical projects. Moreover, they made me understand the social responsibility shouldered by designers and improve my thinking patterns. The two teachers' rigorous teaching and their profound and responsible attitude to the students have allowed me to raise my self-demands and keep me motivated to move forward.

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