

DOI: 10.35643/Info.28.1.11

Dossier temático: Comportamiento humano informativo

Information behaviour research in Japan

Investigación en comportamiento informativo en Japón

Pesquisa de comportamento informacional no Japão

Mamiko Matsubayashi¹ ORCID: 0000-0002-4013-210X

Yukiko Sakai² ORCID: 0000-0003-2795-8297

¹Assistant Professor at the Faculty of Library, Information, and Media Science,
University of Tsukuba, Japan. 1-2 Kasuga, Tsukuba, IBARAKI, 305-8550.
mamiko@slis.tsukuba.ac.jp

²MSIS, PhD, Associate Professor at the Center for General Education at
Teikyo University, Japan. No.8 Building-9F-908. 359 Otsuka, Hachiojishi,
TOKYO 192-0395. ysakai@main.teikyo-u.ac.jp

Abstract

Purpose: Information behaviour research in Japan has evolved into various forms since the early 1990s. To grasp the changes and achievements of information behaviour research over the past 30 years in Japan, a literature review was conducted. Health-related information behaviour research was also reviewed, as a prominent topic.

Methods: Candidate literature were identified from database searches and other

sources. Starting with 1153 identified articles, from 163 candidates, 67 final literature samples were selected according to certain criteria.

Results: In the first half of this paper, we review the evolution of information behaviour research over the past 30 years. Although theoretical research in information behaviour has been continuously conducted from the beginning of the 1990s to the present, research in social practice has received significant interest in recent years. From the viewpoint of research targets, research in Japan can be categorised into two types, i.e. information seeking and media use. In the second half of this paper, we introduce studies on health-related information behaviour by citizens. In the early stages, fact-finding surveys regarding health information behaviour that target a wide range of people were conducted extensively. Subsequently, studies investigating the factors that affect health information behaviour, such as health literacy and the effect of health information, gradually increased. Additionally, specific topics, such as cancer, COVID-19, and the issues among the elderly, have garnered increasing attention.

Conclusion: It is expected that information behaviour research in Japan will be further developed to focus on specific contexts and information environments.

Keywords: Information behaviour; Information practices; Health information; Japan.

Resumen

Objetivo: La investigación del comportamiento de la información en Japón ha evolucionado en varias formas desde principios de la década de 1990. Para comprender los cambios y logros de la investigación del comportamiento de la información en los últimos 30 años en Japón, se realizó una revisión de la

literatura. También se revisó la investigación del comportamiento de la información relacionada con la salud, como un tema destacado.

Métodos: la literatura candidata se identificó a partir de búsquedas en bases de datos y otras fuentes. A partir de 1153 artículos identificados, de 163 candidatos, se seleccionaron 67 muestras de literatura final de acuerdo con ciertos criterios.

Resultados: En la primera mitad de este artículo, revisamos la evolución de la investigación del comportamiento de la información en los últimos 30 años. Si bien la investigación teórica en el comportamiento de la información se ha realizado de manera continua desde principios de la década de 1990 hasta el presente, la investigación en la práctica social ha recibido un interés significativo en los últimos años. Desde el punto de vista de los objetivos de la investigación, la investigación en Japón se puede clasificar en dos tipos, es decir, búsqueda de información y uso de los medios. En la segunda mitad de este documento, presentamos estudios sobre el comportamiento de información relacionada con la salud por parte de los ciudadanos. En las primeras etapas, se realizaron ampliamente encuestas de investigación sobre el comportamiento de la información de salud dirigidas a una amplia gama de personas. Posteriormente, aumentaron gradualmente los estudios que investigan los factores que afectan el comportamiento de la información de salud, como la alfabetización en salud y el efecto de la información de salud. Además, temas específicos, como el cáncer, el COVID-19 y los problemas de las personas mayores, han atraído una atención cada vez mayor.

Conclusión: se espera que la investigación del comportamiento de la información en Japón se desarrolle aún más para centrarse en contextos y entornos de información específicos.

Palabras clave: Comportamiento de la información; Prácticas de información; Información de salud; Japón.

Resumo

Objetivo: A pesquisa de comportamento informacional no Japão evoluiu em várias formas desde o início dos anos 1990. Para entender as mudanças e conquistas da pesquisa de comportamento informacional nos últimos 30 anos no Japão, uma revisão da literatura foi realizada. A pesquisa de comportamento de informações relacionadas à saúde também foi revisada, como um tópico de destaque.

Métodos: A literatura candidata foi identificada a partir de pesquisas em bancos de dados e outras fontes. Começando com 1.153 artigos identificados, de 163 candidatos, 67 amostras finais de literatura foram selecionadas de acordo com determinados critérios.

Resultados: Na primeira metade deste artigo, revisamos a evolução da pesquisa sobre comportamento informacional nos últimos 30 anos. Embora a pesquisa teórica em comportamento informacional tenha sido conduzida continuamente desde o início da década de 1990 até o presente, a pesquisa em prática social tem recebido um interesse significativo nos últimos anos. Do ponto de vista dos alvos de pesquisa, a pesquisa no Japão pode ser categorizada em dois tipos, ou seja, busca de informações e uso de mídia. Na segunda metade deste artigo, apresentamos estudos sobre o comportamento de informação relacionada à saúde por parte dos cidadãos. Nos estágios iniciais, foram realizadas extensivamente pesquisas para apuração de fatos sobre o comportamento de informações sobre saúde que visam uma ampla gama de pessoas. Posteriormente, os estudos que

investigam os fatores que afetam o comportamento da informação em saúde, como a alfabetização em saúde e o efeito da informação em saúde, aumentaram gradualmente. Além disso, temas específicos, como câncer, COVID-19 e questões entre os idosos, têm atraído cada vez mais atenção.

Conclusão: Espera-se que a pesquisa de comportamento informacional no Japão seja mais desenvolvida para se concentrar em contextos e ambientes de informação específicos.

Palavras-chave: Comportamento informacional; Práticas de informação; Informação de saúde; Japão.

Fecha de recebido: 01/09/2022

Fecha de aceptado: 27/03/2023

1. Introduction

Information behaviour (IB) research in Japan has been conducted continuously since the 1990s. There are various studies, ranging from theoretical studies on key concepts related to IB to clarification of IB based on investigations or field surveys. The research subject has gradually changed over the past three decades. Initially, the information-seeking behaviour (ISB) of people in various contexts was the primary research objective, but gradually research is increasingly

focusing on the relationship between the social context in which the actors are embedded and their IB, including the information sources they use (e.g., information media).

Research on IB has produced various results, but surveys on citizens' health IB are particularly rich. With the introduction of evidence-based medicine (EBM) in Japan in 2000, IB research in healthcare has been observed whereby citizens, as decision-makers, acquire health information. The initial results were mainly questionnaire surveys of adults and non-disease-specific patients (Yamaguchi, 2001; JMLA, 2002; Sakai 2012, 2015) by library and information science personnel from an EBM support perspective. Because the phrase 'information-seeking behaviour' was adopted by the MeSH in 2010, several different IB research findings have been published by researchers and practitioners in health care, health communication, and other related fields.

Therefore, the purpose of this paper is twofold. The first is to review the development of IB research in Japan over the last three decades, dividing it into two parts in terms of the main research objects, treating information behaviour as seeking information or as media use. The second is to elaborate health information behaviour research in Japan, which is organised into two sections: 'research objects' and 'area of interest'. We focus on health-related information behaviour research because it is particularly rich in research results compared to other topics, and as noted by Case & Given (2016, p.365), this type of research is expected to increase in the future.

2. Methods

Figure 1 shows the process of selecting final samples of literature. We conducted a database search on four databases for articles on Nov 2, 2022, as shown in Table 1 and identified 1153 articles written by Japanese researchers or researchers affiliated with institutions in Japan. After excluding duplicates, articles with outside the topics, articles published outside of years between 1990 and 2022, articles in languages other than English or Japanese, and articles other than original articles, literature from other sources were added. The additional 50 literature samples were identified by manually searching three major library and information science journals published in Japan (i.e., *Journal of Information and Media Studies*, *Journal of the Japan Society of Library and Information Science*, and *Library and Information Science*) and on the authors' personal bibliographic lists. From 163 candidates, 67 literature samples were selected as final samples, according to the criteria. One of the selection criteria was that the article must be an original, peer-reviewed article. Second, the studies reported in the literature were limited to information behaviour research, which focused on human behaviour rather than information media to comply with the maximum number of pages. The final breakdown comprised 31 Japanese articles, 19 English articles, and 17 other types of literature (e.g., dissertations, books, reports, chapters, conference papers, etc.) including seven in Japanese and ten in English.

Figure 1. Flowchart outlining the protocol adapted in this review.

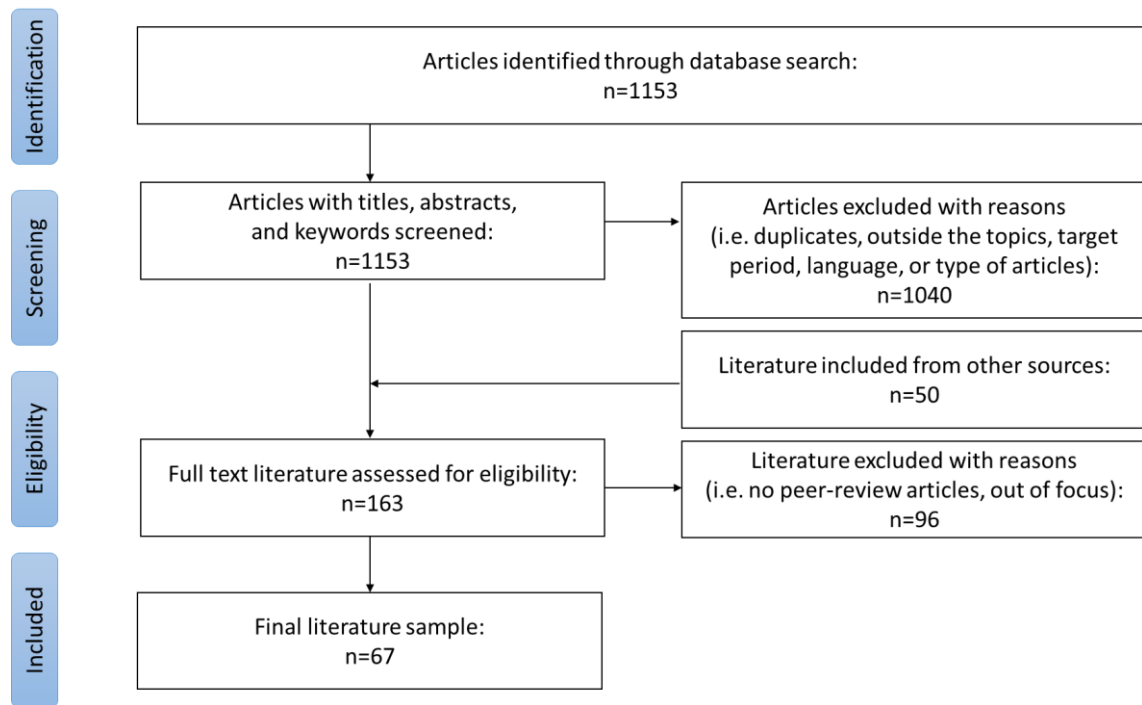


Table 1. Detail of database search

Name	Main Language	Field	Search strategy	# of Searched articles	# of Candidate articles
CiNii Research	Japanese	All	KY=情報行動 AND TP=論文 AND PY=1990-2022	521	10
Ichushi	Japanese	Health	((情報探索行動/TH or 情報探索行動/AL)) and (DT=1990:2022 PT=原著論文CK=ヒト)	325	35
Scopus	English	All	TITLE-ABS-KEY ("information behavior" OR "information seeking") AND PUBYEAR > 1989 AND PUBYEAR < 2023 AND (LIMIT-TO (AFFILCOUNTRY, "Japan"))	280	42

PubMed	English	Health	((((Information Seeking Behavior[MeSH Major Topic]) AND ("1990/01/01"[Date - Publication]: "2022/11/02"[Date - Publication]))) AND (Japan)	27	27
--------	---------	--------	--	----	----

3. Overview of Information Behaviour Research in Japan

3.1. Theoretical research in information behaviour

Several Japanese researchers have proposed new theories and models on IB to construct a theoretical foundation for IB research. Typical examples include research on ‘understanding’ of information needs and uses by Itoga (1991, 1992), ‘information behavioural grammar model’ by Miwa(2000, 2001), and a series of studies on IB focused on the social aspect by the research group headed by Shunsaku Tamura. These are all characterised by a human-centred, holistic view that aims to simultaneously handle the actor's perceptions and social context.

Itoga (1991) noted a paradigm shift in information needs and use research in the 1980s, explaining that information is not an object but a process and that it is important to understand, rather than explain ISB. Moreover, Itoga (1992) argued that understanding another person’s information needs, not describing human ISB, is possible by adopting social phenomenology. This alternative framework has

implications for the theory and practice of information system design.

Miwa (2000, 2001) constructed an information behaviour grammar (IBG) model based on the analysis of information problem-solving processes of the users of the AskERIC Q&A Service, a free internet-based digital reference service in the educational domain. The model encompasses elements that Bandura's social learning theory focuses on, such as 'goal multiplicity', 'causal interrelation between behaviour, internal cognition, and the external environment', and 'self-efficacy'. The idea was that the model could show patterns of ISB by distinguishing the goals of ISB into 'distal goals' and 'proximal sub-goals'. Particularly, by considering that the 'higher level of distal goal', i.e., problem solving, generates the 'proximal sub-goal' of satisfying information needs and that the 'proximal goal' triggers ISB, we could show the patterns of ISB. Miwa's IBG model describes the interaction between external behaviour, internal cognition, and the social and physical environment surrounding the ISB (Miwa, 2015). Miwa (2021) used this model to illustrate how goals of public library users change in the ISB process.

Furthermore, Tamura (2001) conducted an extensive review of research on information use, from the 1940s to IB research in the 1990s, from which he discovered that IB research lacked breadth owing to excessive focus on the process of individual information use. He also explained the importance of adopting a social perspective to overcome such blockages. Ikeya (2001) followed Tamura's argument and discussed information use as behaviour without efficiency or rationality. Specifically, by supporting Schutz's concept of the social distribution of knowledge, she positioned IB as practical knowledge management and discussed its characteristics. Awamura (2009) introduced Chatman's theory to

IB research and showed that discussing the mutual reflectivity between ISB or information use and society was possible. These studies were later developed into information practice studies in Japan.

Recently,

Sakai et al. (2012, 2017) highlighted that there has been a movement in the humanities and social sciences known as the ‘pragmatic turn’, which emphasises the concept of ‘practice’ and that this is also occurring in IB research. The study then attempted to develop a pragmatic turn in information research by describing IB in the ‘workplace’ using ethnomethodology. Specifically, by conducting fieldwork in Japanese manufacturing workplaces, practitioners described the information concept as a phenomenon by examining the social context of collaborative work without separating it from the IB within it.

However, studies by Matsubayashi (1995) on Brenda Dervin's sense-making approach and Awamura (2006) on Sanda Erdelez's concept of information encountering, among others, have individually taken up representative theories in IB research and examined them in various ways. Another study that relies on individual theories but is aimed to lead to practical research is Kunimoto's (2010) study on the initiation mechanism of ISB. Wilson's IB model was carefully analysed and investigated, with a particular focus on the initiation of ISB, to clarify how people searching for medical and healthcare information initiate the act of searching. Shiga et al. (2017) also attempted to model information needs for collaborative information seeking by building on Taylor's concept of information needs.

3.2. Research focused on information behaviour as seeking

information

3.2.1. Study of information behaviour by undergraduate students

In Japan, as in other countries, there are several studies on IB conducted by university students, but its significant feature is several studies that measure quantitative behavioural data, such as screen capture logs, eye-movement data, and electroencephalogram (EEG) analysis, attempting to explore the characteristics of IB. Miwa and Takahashi (2008) analysed university students' knowledge acquisition and modification during exploratory web searches using eye-movement data and screen capture logs, and found that searchers modified their knowledge while browsing both the list of search results and the contents. Terai et al. (2008) also used screen capture logs and eye movement data to investigate the impact of task differences on ISB. These studies have shown the value of combining qualitative data obtained from interviews with quantitative data, such as eye movement data when studying ISB (Saito et al., 2011). Recently published studies have also investigated the extent to which an actor's burden changes between normal web exploration and the use of curated information using EEG and endogenous eye blink analysis (Takeda, 2017, 2019).

Various research studies have focused on external factors, such as the environment in which university students conduct their ISB and the cultural context of the actors. For example, Shishido (1997) conducted a study that investigated the challenges of searching with the newly introduced Online Public

Access Catalogue (OPAC) and depicted how searchers were dissatisfied with some of the OPAC results. Terai (2011) experimented on how university students search in a hybrid information environment where physical and online information sources are simultaneously available, suggesting that being in an environment where various information sources are available may lead to new discoveries, even for searchers with clear intentions. Some studies have found that the determined role of the searcher in collaborative information retrieval, positively affects information retrieval and knowledge construction (Imazu et al., 2011).

3.2.2. Study of information behaviour by citizens

Studies on citizens' ISB can be broadly classified into those relating to behaviour in public libraries, those targeting web searches, and those relating to behaviour after the Great East Japan Earthquake disaster.

Sugie (2011) conducted a semi-structured interview survey of public library users and analysed the results obtained using the modified grounded theory approach (M-GTA) to identify factors that shape users' ISB. 'Accumulated needs and feelings' were found to be a direct motivation for searching, while recognition of the search in the library influenced the way individuals conducted ISB. Sugie (2017) typified physical movements in ISB using an observation method based on radio-frequency identification techniques. The results showed that most users who borrowed materials stayed for a short time and searched for materials on specific

shelves, whereas users who did not borrow materials were less predictable. Uda et al. (2018) conducted an information search experiment on elderly people and found that they can be divided into three groups: (1) active library users with a preferred search method (not changing their method even if it fails); (2) sporadic library users having a preferred search method; and (3) sporadic library users with no particular preference for a search method.

Many studies have been conducted on citizens' web searches. For example, Yamamoto et al. (2018) found that careful web searchers have higher cognitive needs and educational backgrounds and that the more careful they are, the more they include words such as 'truth' and 'evidence' in their search terms. Minami et al. (2016) investigated the characteristics of web searchers from the perspective of information retrieval skills and found that web searchers (1) do not use advanced information retrieval techniques, such as Boolean operators, (2) are highly aware of the selection of search terms, and (3) browse multiple search results under certain evaluation policies.

There were many studies on IB and communication after the Great East Japan Earthquake of March 2011. Several studies focused on the role of social media in disaster settings, but others focused on the feature of ISB. Through interviews with 28 disaster survivors, Asai et al. (2013) categorised ISB immediately after a disaster into five main types: (1) understanding what to do, (2) confirming the safety of loved ones, (3) obtaining information for survival, (4) seeking information to return to daily life, and (5) informing others of their own safety. Through a content analysis of survivor's testimonial collections, Rahmi et al. (2019) found that there are active and passive needs and various sources and channels that can satisfy passive needs, whereas there are limited sources and

channels that can satisfy active needs. Nagano and Joho (2020), through M-GTA of the experiences of 27 disaster survivors, typified the tsunami evacuation process by focusing on ISB and found that there were four types: (1) decision-making for evacuation, (2) highly planned evacuation, (3) poorly planned evacuation, and (4) evacuation after the action was completed. Matsubayashi et al. (2012) surveyed 1,200 men and women across Japan regarding the extent to which they sought and actually searched for specialised information on scientific, technical, and medical matters following the disaster. Therefore, it became clear that the need for specialised information increased among disaster victims throughout Japan and that the lack of knowledge regarding the search for specialised information made it difficult to search for such information.

3.3. Research focused on information behaviour as media use

3.3.1. Study of information behaviour by researchers

Researchers have studied IB in the context of scholarly communication and media use. Particularly, many have focused on the impact of the emerging electronic media on researchers' research activities which tend to be field-specific studies targeting researchers from universities and research institutions in Japan.

Akazawa and Ueda (1998), Kurata et al. (1998), and Sakai and Kadoya (2000) clarified using computers in research activities (experiments, writing, and

literature searches) and electronic media, such as e-mail, electronic journals, and WWW, in the fields of economics, psychology, and medical research, respectively. In their studies, around the 2000s although using computers in research activities was becoming more widespread and using electronic media in informal communication (exchanges between researchers using e-mail, etc.) was on the rise, the fact that electronic journals were not widely used reveals that computerisation in formal communication was not advanced at the time.

In the 2000s, an increasing number of usage surveys focused on the extent of formal communication digitisation. Kurata et al. (2007) surveyed researchers in pathology, chemistry, and physics and found a marked increase in electronic journal use across all fields. Kurata et al. (2009) conducted a study of medical researchers focusing on the acquisition and reading of articles and found that search tools, such as Google Scholar, which was the focus of considerable attention at the time, were rarely used and that there was a fixed pattern of PubMed usage in article acquisition. In the mid-2000s, a similar usage survey was conducted with researchers affiliated with private companies or research institutions at the National Diet Library (NDL). Matsubayashi et al. (2009) found that in life science, researchers affiliated with private companies or research institutions do not differ from researchers affiliated with universities, essentially, reading e-journals as frequently as researchers in universities.

The Standing Committee for Research on Academic Libraries (SCREAL) conducted fixed-point surveys at research universities and institutions in Japan (not all institutions were included) in 2007, 2011, and 2014. The results showed that the use of e-journals and other electronic media was increasing not only in the science, technology, and medical fields but also in the humanities and social

sciences.

3.3.2. Study of information behaviour by citizens

A representative study of IB, on ‘media use’ of the citizens in Japan is the book *Information Behaviour of the Japanese*, published every five years since 1995. This is a series of national surveys that aim to clarify various media usage by citizens in their daily lives, focusing on periods and situations, providing a fairly detailed picture of trends in media use, such as what media each generation uses most frequently. It reveals a gradual increase in Internet usage from the time when television and newspapers were dominant to the time they were replaced by social media. The NDL has conducted a national survey of the IB of citizens, considering the element of library use, and published the survey results and its raw data (NDL, 2015).

4. Health Information Behaviour

This chapter presents an overview of health IB research by citizens, categorised based on 4.1 focus as research objects and 4.2 area of interest.

4.1 Categories based on focus

4.1.1 Research focusing on general topics and information resources

The initial health IB research was a fact-finding survey that explored topics and information sources using questionnaires targeting adult citizens and patients with various diseases. Currently, surveys are also being conducted targeting people with specific characteristics, such as patients with specific diseases, the elderly, and foreign residents.

Early surveys on daily passive health information behaviour included questions on broad topics of interest. Naturally, citizens without diseases were most interested in 'disease prevention' (JMLA, 2002) and patients were most interested in 'diseases' (Yamaguchi, 2001), followed by 'medicine' in both groups.

Regarding active health ISB, Sakai et al.'s 2008 and 2013 repeated surveys use the critical incident method (Sakai, 2012, 2015). Approximately 48–52% of the population had taken exploratory behaviour in the past two years. The most sought topics were 'disease,' 'doctors and hospitals,' and 'medicine.' It was speculated that a health need event leading to a specific need led to the search. The Internet has become a source of information for active exploration. This is confirmed by Sakai et al.'s repeated surveys, in which the top source of information was reversed from 'physician' (57% and 53%) to 'Internet' (44% and 59%), respectively. However, the source of daily health information remains

unchanged, with general mass media at the top, followed by family and friends (Takayama, 2016). 'Family/friends' was the top choice in a survey specific to foreigners living in Japan, exceeding 50% (Hara, 2021; Takaku, 2015). Their native language-speaking family/friends are an important source of information because it is difficult for them to understand Japanese.

4.1.2 Factors affecting information behaviour

Health literacy is a major factor influencing information behaviour in health and medical care. The concept of health literacy was introduced in Japan around 2000 in conjunction with EBM and consumer health information and has attracted attention among researchers in health care, health communication, and library and information science. When an international comparative survey in 2013 pointed out that Japanese people's health literacy was inadequate (Nakayama, 2015), it was once again recognised as an important health policy issue, and related research has become active.

In health literacy research, inadequate health literacy has been identified in terms of the process of information behaviour and its level. Based on the results, education for citizens to compensate for the lack of literacy and support programs has been considered from the perspective of information providers.

Among the processes of obtaining, understanding, evaluating, and utilising health information related to health literacy, the lack of health literacy can be confirmed, especially 'evaluation' and 'utilisation,' in the 2013 international comparison of

the population survey in Japan. However, the results for the weak points are different, depending on the research that is limited to specific groups. For example, in an experimental study in which 15 university students searched the Internet for health topics, they complained about the difficulties in evaluating and understanding the contents, mainly owing to the difficulty of technical terms (Kobayashi, 2019). In addition, in an interview survey of 21 preschool children's parents, it was confirmed that they read contents only at 'easy-to-browse sites' because they could not find, read, and apply difficult information on other sites. The results indicate the limited application of adequate information for children's health (Funaki, 2020).

As a survey targeting the elderly, the 2020 national survey that stratified middle-aged and elderly people aged 40–79 showed results similar to those of the 2015 international population survey. Approximately 95% of the participants responded that they could collect health information but only few could verify the reliability and actual use of the information for themselves (76.5% and 72.0%, respectively) (Hashimoto, 2020). However, a survey of 386 elderly people living in urban areas found that, although they could understand, their health literacy was insufficient for the evaluation and acquisition of health information (Shimada, 2021).

There are three levels of health literacy: basic functional health literacy, interactive health literacy for communication, and critical health literacy, with the highest level for discerning information. As shown in research in other countries, surveys conducted in Japan also cited a discrepancy between functional health literacy and the degree of difficulty in the information provided, creating a health communication gap. For example, an experimental survey of university students pointed out difficulties in understanding content owing to technical terms

(Kobayashi, 2019) and reliance on communities because they could not use the Internet or general information sources in Japan owing to the difficulties foreigners living in Japan encounter in understanding Japanese (Hara, 2021; Takaku, 2015).

The degree of functional health literacy and interactive health literacy was examined in a survey of 2,207 adults living in one city in western Japan. The respondents were divided into four groups, and their characteristics were analysed. The results indicate that women and people aged over 60 are more active on both sides (Taguchi, 2011).

4.1.3 Influence of information behaviour on health

The significance of obtaining information in the health and medical fields is to utilise it for appropriate health care and health promotions. In health communication research, from the perspective of information dissemination, behavioural changes are expected, especially in medical consultations, participation in decision-making regarding treatment methods, and health promotion habits.

However, in Japan, health information is usually viewed as the means of acquiring knowledge or a sense of security, whereas health behavioural change is generally limited to certain circumstances. For example, in the initial fact-finding survey, we asked what type of impact the information actually had, and the top answer was 'relief or comfort' (Sakai, 2012; 2015). This contrasts with a nationwide

survey conducted in the United States with similar questions, where the answers mostly consisted of ‘useful for decision-making or facilitated communication with doctors.’

Similarly, in Japan, a national survey in 2007 found that acquiring health information increases knowledge but does not lead to action (Takahashi, 2011). This is because the Japanese people are not good at evaluation and utilisation, and few people can make decisions. Nakayama explained in a discussion on a study citing the correlation between health literacy and COVID-19 infection prevention behaviour that there are few learning opportunities for information evaluation and application among the Japanese people (Nakayama, 2022).

Only a few patient studies have found an association between information acquisition and behavioural changes under specific circumstances. One is a questionnaire survey targeting patients with breast cancer, in which those who seek more information are more likely to actively participate in decision-making (Nakashima, 2012). Another is an interview survey with gynaecologic cancer survivors, indicating that the more information they received, the more likely they were to receive medical care (Oshima, 2013).

4.2 Categories based on specific areas

4.2.1 Cancer information

Cancer has been the leading cause of death in Japan since 1981, and various measures are being taken nationwide. Research on the IB of cancer patients and their families in various age groups is also being actively conducted.

Since 2006, the National Cancer Center has been promoting cancer information service, centred on the Internet as part of national cancer control measures to provide reliable, easy-to-understand, and useful information to the public. Several related studies have supported this information service. For example, a nationwide survey was conducted in 2012 to understand the health information acquisition venues among adults in Japan. Consequently, people obtain health and medical information daily, in the following order: 1) mass media, 2) family/friends, and 3) the Internet. When they are diagnosed with cancer, they obtain information from 1) health experts, 2) medical information on the Internet, and 3) general mass media as well as family and friends (Takayama, 2016).

Owing to the high prevalence of breast cancer among women, the numerous treatment options, and the high need for prognostic information, breast cancer patients are often selected as research targets. Most surveys are based on patients' own ISB using questionnaires (Nakashima, 2012; Tsuchiya, 2018), but interview surveys are also conducted. For example, interviews were conducted with seven breast cancer patients on the advantages and difficulties of using the information on the Internet. (Hashizume, 2019).

Recently, there has been growing interest in cancer among young people. Analysis by information source is a factor involved in decision-making by parents of childhood cancer patients (Watanabe, 2021), addressing the information needs of adolescent cancer patients, and research that clarifies the actual state of information behaviour (Nagai, 2022; Takahashi, 2020).

4.2.2 Elderly people

Japan's aging rate (percentage of the population aged 65 and over) was 28.4% as of October 2019, the highest in the world, and is expected to remain high in the future. Extending the healthy life expectancy of the elderly is an important issue in Japan's health policy, and many information behaviour studies have targeted the elderly.

High health literacy has also been explored among the elderly because it is associated with good health. A survey of 521 elderly people in two prefectures of the Kanto region also revealed that those with high health scores obtained more information from multiple sources (Kinjo, 2017). Similarly, a study of 1144 older adults found a significant association between informed individuals and regular strength training (Harada, 2016). Another concern is related to the aspects requiring support to compensate for the lack of health literacy. The previously mentioned nationwide survey (Hashimoto, 2020) and metropolitan area survey (Shimada, 2021) yielded different results regarding information seeking and acquisition, but both surveys indicated difficulties in evaluating and utilising health information among the elderly.

A study that closely followed the IB process involved interviews with 13 haemodialysis patients aged ≥ 65 years. The study analyses the M-GTA and explains the process of utilising health information with seven categories and two concepts (Hamano, 2020).

4.2.3 COVID-19

Research on IB related to COVID-19 has been accumulating in Japan as in other countries since 2020. On a large scale, there was a national survey of 4,700 adults regarding media use. Although the usage rate of some media is declining, usage time is increasing. According to these results, there is a polarisation in information behaviour where some people avoid information while others spend more time seeking information out of anxiety (Ishibashi, 2021). Another survey of 800 Internet users in their twenties also suggests that avoidance of information was also caused by information overload during the COVID-19 catastrophe (Lee, 2021).

5. Conclusion

As outlined thus far, theoretical studies on IB have been conducted in Japan, including surveys as well as empirical research on IB in various contexts. As discussed in Chapter 3, in the 1990s, ISB was the main research subject, but the focus has gradually shifted to information practices, i.e., the social context and information environment, such as media and information technology, surrounding

the actors of IB. There has also been steady progress in research on IB by citizens in specific contexts (especially in health and medical fields of social concern), as we have elaborated in Chapter 4.

Currently, in Japan, research focusing on understanding and evaluating information media itself has emerged in the context of IB. For example, Iwase (2021) conducted a semi-structured interview on undergraduate students to discuss their understanding of information media in learning, then clarified that the students chose media based on two factors: whether it conformed to the teacher's instructions and was trustworthy. Matsubayashi & Freund (2019) conducted a survey on online news consumption by young adults, focusing on the media used in the activity. They reported that young adults showed heavy reliance upon social media channels as sources of online news, despite the consistently low levels of trust for this type of content.

Therefore, it is expected that Japanese research on IB will be further developed in the future to focus on specific contexts and information environments. It is also expected that health-related IB research on special interest topics, such as cancer and COVID-19, will be increased.

References

- Akasawa, M. & Ueda, S. (1998). Academic economists' use of electronic media. *Library and Information Science*, 40, 1–27. <https://doi.org/10.46895/lis.40.1>
- Asai, D., Sagata, Y., & Asano, Y. (2013). On-site information-seeking behaviors in earthquakes and tsunamis. *Conference on Human Factors in Computing Systems, Proceedings*, 1881–1886. <https://doi.org/10.1145/2468356.2468693>
- Awamura, N. (2006). Rethinking the information behavior model of information

encounters: An analysis of interviews on information encounters on the Web. *Library and Information Science*, 55, 47-69. <https://doi.org/10.46895/lis.55.47>

Awamura, N. (2009). Implications of Chatman's viewpoint for user studies. *Library and Information Science*, 62, 29-80. <https://doi.org/10.46895/lis.62.29>

Case, D. O., & Given, L. M. (2016). *Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior* (4th ed.), Emerald.

Funaki, T. & Iwakuma, M. (2020). Process and factors of Internet health information seeking. Qualitative study of parents of preschoolers. *Journal of the Japan Academy for Health Behavioural Science*, 35(1), 63–71.

Hamano, H., Inagaki, M., Tasaki, K., Matsui, K. & Horiguchi, T. (2020). Process of using health information by elderly patients undergoing hemodialysis. *Journal of Japan Society of Nursing Research*, 43(2), 245–253. <https://doi.org/10.15065/jjsnr.20200131083>

Hara, H., Maeno, M., Kataoka, H., Iwasaki, K., Enomoto, N. (2021). Examination of means of information provision for free health consultation and medical examination for foreigners during the Covid-19 epidemic situation in Shizuoka Prefecture. *Tokai Koshu Eisei Zasshi* 9(1), 98–103. https://doi.org/10.24802/tpha.9.1_98

Harada, K., Shibata, A., Lee, E., Oka, K., Nakamura, Y. (2016). Sources of strength-training information and strength-training behavior among older Japanese adults. *Health Promotion International*, 31(1), 5–12. <https://doi.org/10.1093/heapro/dau052>

Hashimoto, Y., Katagiri, K., Kimura, T., Korenaga, R., Tsuji, D., Mori, Y., Ogasawara, M., Kitamura, S., Kawai, D., & Ono, S. (2020). Information behavior of middle-aged and elderly people. *Research Survey Reports in Information*

Studies. Interfaculty Initiative in Information Studies, the University of Tokyo, 36, 264-319. <https://doi.org/10.15083/00079076>

Hashizume, K., Goto, H., & Yamamoto, A. (2019). Advantages and difficulties of using information from the Internet for patients with breast cancer. *Health Science Research*, 32, 75–85.

Ikeya, N. (2001). Information in the world of life Tamura, S. (eds.) *Information Seeking and Use*, 1-39, 189-227, Keiso Shobo. [in Japanese]

Imazu, M., Nakayama, S. & Joho, H. (2011). Effect of explicit roles on collaborative search in travel-planning tasks. *Notes in Computer Science* (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics) Vol. 7097 LNCS. https://doi.org/10.1007/978-3-642-25631-8_19.

Ishibashi, M., Yasumoto, S., Iwasaki, M., Ishiakawa, T., Waragai, S. & Sekiya, N. (2021). Relationship between anxiety and COVID-19 and information behavior. *Saigai Joho*, 19 (1), 73-83. https://doi.org/10.24709/jasdis.19.1_73.

Itoga, M. (1991). Meaning and understanding in human information uses: A critical study of information needs based on the sense-making concept. *Library and Information Science*, 29, 1-29. <https://doi.org/10.46895/lis.29.1>

Itoga, M.(1992). Seeking Understanding beneath the Unspecifiable: an Alternative Framework for Mapping Information Needs in Communication. *Libri*, 42(4), 330–344. <https://doi.org/10.1515/libr.1992.42.4.330>

Iwase, A. (2021). University students' understanding of information media in learning: A focus on the decision-making for selection. *Library and Information Science*. 85, 1-22. <https://doi.org/10.46895/lis.85.1>

Japan Medical Library Association Working Group (2002). Demand survey for health and medical information among citizens. Research report for the

development and provision of the EBM database in Japan. *Heisei* 13, 7–15.
<https://mhlw-grants.niph.go.jp/project/5555> [in Japanese]

Kinjo, H., Ishii, K., Saito, T., Nomura, N., & Hamada, A. (2017). A survey on how older adults access medical and health information and the types of problems they face in accessing it. *Japanese Journal of Gerontology*, 39(1), 7–20.
https://doi.org/10.34393/rousha.39.1_7

Kobayashi, R., & Ishizaki, M. (2019). Examining the interaction between seeking medical information online and understanding: Exploratory study. *JMIR Cancer*, 5(2). <https://doi.org/10.2196/13240>

Kunimoto, C. (2010). How people initiate information-seeking behavior: Case studies of seeking medical information. *Library and Information Science*, 64, 55-79. <https://doi.org/10.46895/lis.64.55>

Kurata, K., Matsubayashi, M., Mine, S., Muranushi, T., & Ueda, S. (2007). Electronic journals and their unbundled functions in scholarly communication: Views and utilization by scientific, technological, and medical researchers in Japan. *Information Processing and Management*, 43(5), 1402-1415.
<https://doi.org/10.1016/j.ipm.2006.01.006>

Kurata K., Mine, S., Morioka T., Sakai, Y., Kato, S., & Ueda, S. (2009). Reading and information seeking behavior of Japanese medical researchers in the era of electronic journals and open access. *Library and Information Science*, 61, 59-90.
<https://doi.org/10.46895/lis.61.59>

Kurata, K., Takashima, Y., Matsubayashi, M., Matsui, M. & Muranushi, T. (1998). Research activity and electronic media use in networked situations: A survey of psychological faculty at Japanese universities. *Annals of the Japan Society of*

Library Science, 44(4), 143-158. https://doi.org/10.20651/ajsls.44.4_143

Lee, J. (2021). Responses to media coverage of the COVID-19 pandemic and information behavior in the Japanese context. *SEARCH Journal of Media and Communication Research*, 13(1), 111–126.

Matsubayashi, M. (1995). The significance of Brenda Dervin's 'sense-making' approach and its application to user studies. *Library and Information Science*, 34, 1-16. <https://doi.org/10.46895/lis.34.1>

Matsubayashi, M., & Freund, L. (2019). A comparative study of online news use by young adults in Canada and Japan. *Proceedings of the Association for Information Science and Technology*, 56(1), 730–732. <https://doi.org/10.1002/pr2.152>

Matsubayashi, M., Toshimori, A. & Kurata, K. (2012). Need and search for specialized information in the scientific, technical, and medical fields by the general public in Japan after the Great East Japan Earthquake. *Proceedings of the Information Behavior Conference: Information Seeking in Context*, 2012 (Tokyo).

Matsubayashi, M., Toshimori, A. & Nagata, H. (2009). Survey of Life Science Researchers with Institutions/Companies in Japan on Their Use of Electronic Resources. *Journal of the Japan Society for Library and Information Science*, 55(3), 141-154. https://doi.org/10.20651/jslis.55.3_141

Minami et al., (2016). Information Retrieval Skills in a Web Environment. *Journal of the Japan Society for Library and Information Science*, 62(3), 163-180. https://doi.org/10.20651/jslis.62.3_163

Miwa, M. (2000). Use of human intermediation in information problem-solving: A user's perspective. Syracuse University ProQuest Dissertations Publishing. 9977391.

Miwa, M. (2001). User Situations and Multiple Levels of user goals in the information problem-solving processes of AskERIC users. *Proceedings of the ASIST Annual Meeting*, 38, 355-71.

Miwa, M. (2015). Re-thinking of information behavior grammar model. In Ikeya, N., Agata, M., Suga, C. (eds.) *The library connects people, books, and information*, 149-159. KeisoShobo. [in Japanese]

Miwa, M. (2021). Capturing changing user goals in the information-seeking process using the information behavioral grammar model. *Libres*, 31(1), 1–11. <https://doi.org/10.32655/LIBRES.2021.1.1>

Miwa, M., & Takahashi, H. (2008). Knowledge acquisition and modification during students' exploratory Web search processes for career planning. *Information Research* 13(4): 376. <http://InformationR.net/ir/13-4/paper376.html>

Nagai, S. & Tomioka, A. (2022). Information needs of adolescents with cancer who return to social life. *AYA ga no iryo to shien*, 2(1), 8–15. https://doi.org/10.34598/ayaoncology.2.1_8

Nagano, G. & Joho, H. (2020). Modelling Tsunami Evacuation Process Focusing on Information-Seeking Behavior. *Journal of Information and Media Studies*, 19(1), 29-46. <https://doi.org/10.11304/jims.19.29>

Nakashima, M., Kuroki, S., Shinkoda, H., Suetsugu, Y., Shimada, K. & Kaku, T. (2012). Information-seeking experiences and decision-making roles of Japanese women with breast cancer. *Fukuoka IgakuZasshi=Hukuoka Acta Medica* 103(6), 120–130. <https://doi.org/10.15017/23480>

Nakayama et al., (2015). Comprehensive health literacy in Japan is lower than that in Europe, which is a validated Japanese-language assessment of health literacy. *BMC Public Health*, 15, 505. <https://doi.org/10.1186/s12889-015-1835-x>

Nakayama, K., Yonekura, Y., Danya, H. & Hagiwara, K. (2022). COVID-19 Preventive Behaviors and Health Literacy, Information Evaluation, and Decision-making Skills in Japanese Adults: Cross-sectional Survey Study. *JMIR Formative Research*, 6(1). <https://doi.org/10.2196/34966>

Oshima, S., Kisa, K., Terashita, T., Kawabata, H. & Maezawa, M. (2013). Care-seeking behavior of Japanese gynecological cancer survivors with adverse effects. *BMC Women's Health*, 13(1). <https://doi.org/10.1186/1472-6874-13-1>

Rahmi, R., Joho, H. & Shirai, T. (2019). Analysis of natural disaster-related information-seeking behavior using temporal stages. *Journal of the Association for Information Science and Technology*, 70(7), 715–728. <https://doi.org/10.1002/asi.24155>

Saito, H., Takaku, M., Egusa, Y., Terai, H., Miwa, M. & Kando, N. (2011). Connecting Qualitative and Quantitative Analysis of Web Search Process: Analysis Using Search Units. In: Cheng, P.-J., Kan, M.-Y., Lam, W., Nakov, P. (eds.) AIRS 2010. *LNCS*, vol. 6458, pp. 173–182. Springer and Heidelberg (2010)

Sakai, S., Awamura, N. & Ikeya, N. (2012). The practical management of information in a task management meeting: taking 'practice' seriously. *Information Research*, 17(4) paper 537. <http://InformationR.net/ir/17-4/paper537.html>

Sakai, S., Ikeya, N., & Awamura, N. (2017). Information behavior as work: practical information management at the meeting. Mizukawa, Y., Akiya, N. & Igarashi, M. *Workplace studies – Ethnomethodology of working*, 121-138. Harvest-sha. [in Japanese]

Sakai, Y. & Kadoya, H. (2000). Do Electronic media change research activities? Media use trends in the Medical Field, 59-97. KeisoShobo. [in Japanese]

Sakai, Y., Kunimoto, C. & Kurata, K. (2012). Health information seekers in Japan: A snapshot of needs, behavior, and recognition in 2008. *Journal of the Medical Library Association*, 100(3), 205–213. <https://doi.org/10.3163/1536-5050.100.3.011>

Sakai, Y., Kunioto, C., & Kurata, K. (2015). Health information-seeking behavior in Japan: Results of the 2008–2013 survey. *Journal of the Japan Society of Library and Information Science*, 61, 82–95. <https://cir.nii.ac.jp/crid/1010282257260308616.bib?lang=ja>

Shiga et al. (2017). Modelling information needs in collaborative search conversations. Proceedings of the 40th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2017), 715-724. SIGIR 2017 (Tokyo, Japan, 07/08/2017 - 11/08/2017) DOI: <https://doi.org/10.1145/3077136.3080787>

Shimada, H., Kawakami, K., Okamoto, M. & Nozaki, M. (2021). Health literacy and related factors among elderly people in urban Japan. *Iryo Kango Kenkyu* 18(1): 63–74.

Shishido, N. (1997). Information-seeking behavior of OPAC users in university libraries: An interview study with students. *Library and Information Science*, 37, 35-54. doi:10.46895/lis.37.35

Sugie, N. (2011). Information-seeking behavior of public library users: Generating concepts and a theory based on a qualitative analysis of interview data. *Journal of the Japan Society for Library and Information Science*, 57(1). 1-18. https://doi.org/10.20651/jslis.57.1_1

Sugie, N. (2017). Classifying library users' behavior through analysis of location information acquired using radio-frequency identification technology. *Journal of*

the Japan Society for Library and Information Science, 63(2), 71-89.
https://doi.org/10.20651/jslis.63.2_71

Taguchi, A., Murayama, H., Ryu, S., Nagata, S. & Murashima, S. (2011). Characterizing active acquirers and communicators of health information for health promotion interventions in the community. *MinzokuEisei*, 77(4), 150–161.
<https://doi.org/10.3861/jshhe.77.150>

Takahashi, T., Yamaki, C. & Takayam, T. (2020). Availability and importance of cancer information. Adolescent and young adult patients. *Journal of the Japanese Association of Health Communication*, 11(2), 37–43.

Takahashi, Y., Ohura, T., Ishizaki, T., Okamoto, S., Miki, K., Naito, M., Akamatsu, R., Sugimori, H., Yoshiike, N., Miyaki, K., Shimbo, T., & Nakayama, T. (2011). Internet use for health-related information via personal computers and cell phones in Japan: A cross-sectional, population-based survey. *Journal of Medical Internet Research*, 13(4). <https://doi.org/10.2196/jmir.1796>

Takaku, M., Ichikawa, S. & Kaneko, N. (2015). Health literacy and related factors among the elderly in urban Japan. *Nihon KoshuEiseiZasshi* 62(11): 684–693.
[10.11236/jph.62.11_684](https://doi.org/10.11236/jph.62.11_684)

Takayama, T. & Yamaki, C. (2016). Identifying an effective health information delivery system based on public health information-seeking behaviors. *Hoken Iryo Shaigaku Ronshu*, 27(1): 39–50. https://doi.org/10.18918/jshms.27.1_39

Takeda M. (2017). Use of Curated Information: Based on Electroencephalogram Analysis. *Journal of the Japan Society for Library and Information Science*, 63(4), 196-210. https://doi.org/10.20651/jslis.63.4_196

Takeda M. (2019). A study on the use of curated information: An analysis of endogenous eyeblinks. *Journal of the Japan Society for Library and Information*

Science, 65(2), 67-83. https://doi.org/10.20651/jslis.65.2_67

Tamura, S. (2001). Research on Information Use (Chapter 1). & Social Significance of Information Use (Chapter 4). Tamura, S. (eds.) *Information Seeking and Use*, 1-39, 189-227, Keiso Shobo. [in Japanese]

Terai H. (2011). Information Seeking Process in Hybrid Information Environment. *Journal of the Japan Society for Library and Information Science*, 57(2), 43-62. https://doi.org/10.20651/jslis.57.2_43

Terai, H., Takaku, M., Saito, H., Miwa, M., Egusa, Y. & Kando, N. (2008). Differences between informational and transactional tasks in information seeking on the web. IliX'08: *Proceedings of the 2nd International Symposium on Information Interaction in Context*, 152–159. <https://doi.org/10.1145/1414694.1414728>

Tsuchiya, M., Masujima, M., Mori, M., Takahashi, M., Kato, T., Ikeda, S. I., Shimizu, C., Kinoshita, T., Shiino, S., & Suzuki, M. (2018). Information-seeking, information sources and ongoing support needs after discharge to prevent cancer-related lymphoedema. *Japanese Journal of Clinical Oncology*, 48(11), 974–981. <https://doi.org/10.1093/jjco/hyy127>

Uda, N., Mizoue, C., Donkai, S., & Ishimura, S. (2018). Information seeking behavior of older adults in a Public Library in Japan. *Libres*, 28(1), 1–12. <https://doi.org/10.32655/LIBRES.2018.1.1>

Watanabe, M., Goto, H., & Nakayama, S. (2021). Information-seeking behaviour factors related to consent for treatment decisions in parents of children with cancer. *Journal of Information and Media Studies*, 1–18. <https://doi.org/10.11304/jims.20.1>

Yamaguchi, N., Abe, S., Eguchi, A., Kawai, F., Suwabe, N., Tsuchida, R., et al.

(2001). Demand survey of patients and families. Project Report of Welfare Science Research Grants Medical Technology Evaluation Comprehensive Research. *Heisei* 12, 19–35. [in Japanese]

Yamamoto, T., Yamamoto, Y., & Fujita, S. (2018). Exploring people's attitudes and behaviors toward careful information seeking in web search. *International Conference on Information and Knowledge Management, Proceedings*, 963–972. <https://doi.org/10.1145/3269206.3271799B>

* [in Japanese] indicates literature in Japanese other than articles. Most Japanese articles have English abstracts.

Editor's Note: The editor responsible for the publication of this article is Martha Sabelli

Author contribution note: MM conceived the structure of the article and wrote Chapter 1,3, and 5. YS selected final samples of literature and wrote Chapter 2 and 4.