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# Social framework to judge the importance of breast cancer

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## ABSTRACT

*Background:* Breast cancer (BC) has profound effects on patients, households, and society, necessitating a multidimensional approach to understand its implications fully. This study aimed to develop a conceptual model for a social framework (SF) that assists in identifying group common values and needs for BC interventions in Hungary. The SF reflects diverse perspectives, including healthcare professionals, patients, caregivers, policymakers of health and social care, health technology developers, and corporate and philanthropic supporters of BC initiatives.
*Methods:* A narrative literature review was conducted to identify value elements (VEs) of BC. VEs were categorized into groups and further clustered into sub-groups within each main category. This literature-based conceptual model was contextualized and adapted to the Hungarian setting through individual and group interviews with various societal group representatives. A closing validation meeting fostered stakeholders' reflection on the draft model.
*Results:* The final conceptual model incorporates five traditional (e.g., clinical outcomes, adverse events, survival, and direct medical costs), nine patient-centric (e.g., personal milestones, patient experience, and financial burden), and seven societal (e.g., disease severity, the presence of the disease around us, and indirect costs) VEs.
*Conclusion:* Our study is the first to present a comprehensive SF that provides insights into key disease challenges and why different BC interventions are important to various stakeholder groups via capturing traditional, patient-centric, and societal VEs. It informs decision-making within and beyond the healthcare domain by supporting the evaluation of policies, health technologies, public and civil society initiatives in Hungary.
*Policy Summary:* While BC is a priority disease area for all stakeholder groups, their views on what contributes to the success of policy decisions are different. If policymakers intend to represent the interests of the whole society, they should aim to express the value of policy interventions in a comprehensive SF.

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## 1. Introduction

Breast cancer (BC) remains one of the most prevalent cancers globally, affecting millions of women annually and representing a significant public health challenge [1]. Despite advancements in BC therapies that have improved survival rates and patient outcomes, the burden of BC continues to grow. In 2022, female BC was ranked as the second leading cause of global cancer incidence [2]. In Hungary, BC is also a leading cause of cancer-related mortality among women [3], and its incidence in women under 50 years of age rose by 30 % between 2011 and 2019, highlighting concern for younger populations [4].

Beyond its health implications, BC imposes substantial limitations on patients' social life, education, economic stability, and professional status, disrupting families and placing strain on economies [5]. This further underscores the need for a comprehensive approach aligning healthcare decision-making with patient-centred [6] and societal priorities. A collaborative effort can help explore the full value of BC interventions and support developing policies that drive better patient outcomes [7].

To guide healthcare decisions, evaluation frameworks have become widely used tools. They integrate elements that capture the value of alternatives across various dimensions, thus supporting value-based priority settings among interventions and patient populations [8]. These frameworks must be tailored to the decision level and context, and the perspectives of the involved stakeholders [9]. In the past, the value of health technologies was judged mainly based on traditional value elements, such as survival benefits, quality of life gains, and incremental healthcare costs. However, there is growing recognition of evaluation frameworks based on extended criteria, which offer a more comprehensive perspective by embedding additional patient-centric and societal value elements [10].

This study aimed to develop a conceptual model for a social framework (SF) that assists in identifying group common values and needs for BC interventions in Hungary. To the best of our knowledge, this is the first study to offer decision-makers within and beyond the healthcare sector a structured approach to evaluating the societal return on investment in medical prevention, diagnostic and curative technologies, rehabilitation, patient support programs, and other BC-related social initiatives not only in Hungary but even in Central and Eastern Europe. The SF reflects diverse perspectives, including healthcare professionals, patients, caregivers, policymakers of health and social care, health technology developers, corporate and philanthropic supporters of BC initiatives, and combines traditional, patient-centric, and societal value elements (VEs).

## 2. Materials and methods

### 2.1. Overview

The SF was developed using a mixed-method research approach conducted in three steps: (i) a narrative literature review to identify potential VEs in BC; ii) semi-structured interviews to contextualize and adapt the literature-based framework, and develop the country-specific SF; and iii) a multi-stakeholder validation meeting with an expert panel to reflect on the SF.

Successful and effective stakeholder engagement requires the involvement of a credible patient organization. The Bridge of Health Alliance Against Breast Cancer (BHAABC) fostered collaboration among representatives of different stakeholder groups. As the initiation of the multi-stakeholder dialogue, an opening meeting was organized by BHAABC in May 2024 to present research objectives and introduce participating societal groups to each other. Viewing engagement as an adaptive process was essential for meaningful collaboration throughout the whole research [11]. The steps of the research and stakeholder management are described in Fig. 1, and the number of stakeholder groups' representations in each phase is presented in Table 1.

### 2.2. Ethical considerations

Ethical approval was obtained from the Hungarian Scientific and Research Ethics Committee (registration number: BM/14996–1/2024). Participants were asked to sign consent forms and data privacy statements to participate in the research.

### 2.3. Research steps

#### 2.3.1. Literature review on value elements

A narrative literature review was conducted using Medline (via PubMed) to generate a comprehensive list of potential VEs in BC. The search strategy combined search strings related to BC, value frameworks, and societal perspective, ensuring the inclusion of all relevant keywords and their synonyms in the literature. The search was conducted in March 2024 and was limited to studies published in the past 10 years for BC specific publications, while time restriction was not applied to literature on value frameworks with societal perspective. No geographical restriction was imposed. The detailed search strategy, along with the number of search hits, is provided in Supplementary Material 1.

Citation data of all identified search hits were imported into EndNote X9 reference management software. As the first step, title and abstract screening were conducted for all identified records by a single reviewer. In the second step, potentially eligible articles were screened in full text by a single reviewer. The exclusion criteria were as follows: (i) articles without an abstract or an English abstract; (ii) articles not published in English or Hungarian; and (iii) articles lacking any potential VE relevant to BC. A VE was defined as: (i) "all that matters in BC" (i.e., any element capturing the importance of BC); or (ii) any BC-related decision criterion, regardless of the decision-making level and context. This includes any element that could serve as a differentiating criterion between BC health technologies or when comparing BC to other disease areas.

Data extraction from the included articles was performed by a single reviewer for each included record using a Microsoft Excel data extraction sheet. The extraction process focused exclusively on VEs. Data on VEs were extracted as described in the original text. When a VE was self-explanatory, such as "motherhood" or "survival," no further explanation was recorded. However, when clarification was needed, additional details (i.e., a definition or description as outlined in the source) were extracted alongside the name of the VE to ensure accurate interpretation. Following data collection, the coding and categorization of VEs identified in the literature were conducted iteratively by the core research team (ZRP, KT, DH, AB, TA, ZK, MD), one of them a patient representative who is also a BC survivor. To minimize overlaps and redundancies in the long list of VEs, duplicates were removed, and similar expressions or themes were merged under umbrella terms. Some umbrella terms already existed in established frameworks, such as those of ISPOR - The Professional Society for Health Economics and Outcomes Research [12], the ICER - Institute for Clinical and Economic Review [13], or McQueen et al. [9], while others were newly formulated by the research team. Then, VEs were assessed for completeness, clarity, and non-redundancy and clustered into three predefined categories: traditional, patient-centric, and societal. Any disagreements regarding VE names, definitions, or categorization were resolved through mutual consensus. Finally, VEs were translated into Hungarian by the research team.

The preliminary results of the literature review supported the discussion of the opening meeting, while the literature-based conceptual model served as the foundation for the interviews.

#### 2.3.2. Semi-structured interviews

Thirteen online interview sessions were conducted via Microsoft Teams: five group sessions and eight individual sessions with a total of 24 participants. Discussions were recorded, transcribed for data extraction, and will be deleted after five years. All interviews took place between July 11 and September 20, 2024, and were facilitated along a presentation slide deck, maintaining consistency in questions across both individual (60 min) and group interviews (90 min). Two researchers were present for each session. Based on feedback from the pilot interview, the structure and questions were refined.

In the first part of the interview, four open-ended questions (Supplementary Material 2) were posed to explore participants' approach and their personal and social experiences of BC. Then the literature-based conceptual model was presented for discussion. Participants got acquainted with the VEs and were guided through the three categories: traditional, patient-centric, and societal. They were asked to comment on the criteria's relevance or irrelevance given the Hungarian healthcare and broader societal context. Interviewees were asked to identify any gaps or shortcomings in the framework.

Thematic analysis was applied to all transcripts as data analysis methodology. This method allowed a systematic approach for identifying, analysing, and reporting patterns or themes related to already identified VEs and further mentions of importance [14].

Coding and data extraction were carried out by a single researcher, using a Microsoft Excel sheet. The table reflected participant roles, identified themes, quotes from the text, and associated VEs. Data extraction, grouped by stakeholder groups, was discussed, and consensus was reached through deliberation and collaborative analysis by the core research team.

### *2.3.3. Multi-stakeholder validation meeting*

The final step of the SF development was a validation meeting with multiple stakeholders in November 2024 in Budapest, co-organized by the Hungarian Health Economics Association. The conceptual model was presented, and a discussion was facilitated among the panel members (9 eminent experts of different stakeholder groups) and the audience. Participants could contribute in person to the societal dialogue on BC, emphasizing their priorities and concerns.

The validation meeting was transcribed from the notes of three researchers (ZRP, AB, DH), ensuring accuracy and completeness for subsequent analysis carried out using the same methods, applied to other qualitative data.

## 3. Results

A total of 136 articles (118 articles from the BC-related search string and 18 articles from the value framework related search string) were identified using the search strategy and went through the title/abstract screening. 91 records were selected for full-text screening, from which two articles were excluded (one article was not published in English or Hungarian, and the other did not contain VEs). Finally, 89 articles were included in the review. From these publications, 773 potential VEs were extracted. Through an iterative process, the long list of VEs was streamlined by removing duplicates, minimizing overlaps, and merging similar VEs. The literature-based conceptual model consisted of 20 VEs categorized into traditional, patient-centric, and societal.

The interviews and the multi-stakeholder validation meeting resulted in important changes in several VEs (Table 2). For instance, "*Adverse events*", "*Quality of life*", and "*Patient experience*" were renamed to "*Treatment-related adverse events and toxicity*", "*Health-related quality of life of the patient*", and "*Patient experience related to disease management and health technology*", respectively, to enhance their clarity for all different stakeholders.

In the literature-based conceptual model, "*Patient empowerment*" was intended to capture both "*Shared decision-making*" and "*Health literacy of*

**Table 1**
Number of participants from each stakeholder group involved in the research project.

| Stakeholder group | Opening meeting* | Interview** | Expert panel of the multi-stakeholder validation meeting*** |
|---|---|---|---|
| Number of patients/patient advocacy group representatives | 2 | 6 | 1 |
| Number of caregivers | 1 | 2 | - |
| Number of healthcare professionals | 4 | 8 | 2 |
| Number of policymakers | 1 | 2 | 6 |
| Number of representatives from companies supporting breast cancer advocacy and/or caring workplace for affected employees | 2 | 3 | - |
| Number of representatives from corporations developing health technologies | 3 | 6 | - |

* No data collection during the Opening meeting. It served stakeholder engagement purposes only.
** Three participants represented 2 stakeholder groups in the interview process. The total number of participants was 24.
*** All stakeholder groups were represented in the audience.

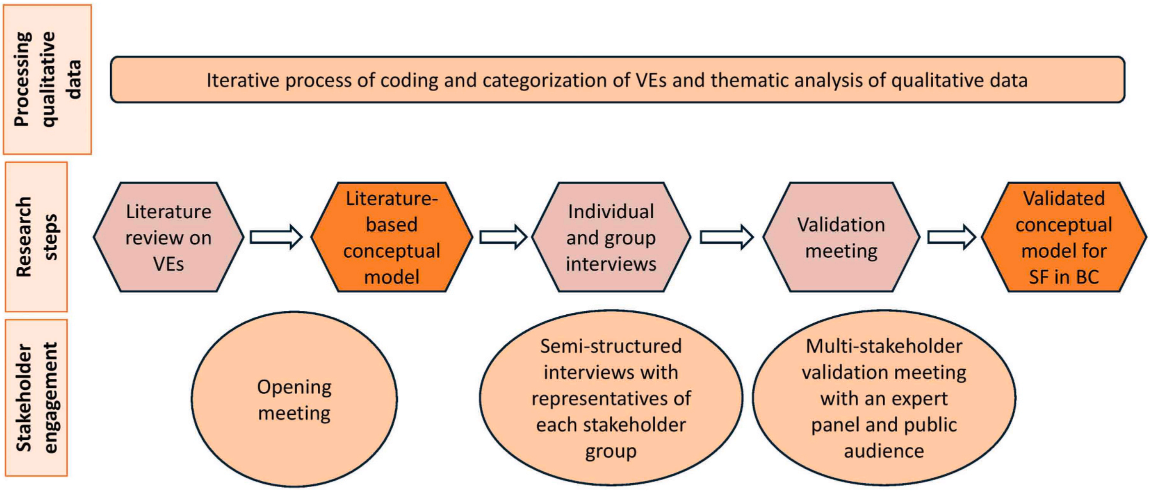

**Fig. 1.** Overview of the research project. Footnotes: BC: breast cancer; SF: social framework; VE: value element;.

*the patient”;* however, it became evident that these sub-elements hold significant importance for multiple stakeholder groups. Consequently, they were separated as distinct VEs to “*Health literacy of patients*” and “*Involvement of patients and caregivers in decision-making*”.

To minimize overlap and interdependence between VEs, “*Adherence to therapy*” was removed, as it is largely influenced by “*Patient experience related to disease management and health technology*”, “*Health literacy of patients*”, and “*Involvement of patients and caregivers in decision-making*”.

The societal VE “*Goal of the therapy*”, initially described in the literature as a binary concept, either curing or extending life, was redefined as “*Value of hope*”, a patient-centric VE that more accurately captures the preference for health technologies offering a chance of a highly positive outcome, even if the probability is low.

In the draft conceptual model, “*Access to healthcare solutions*” and “*Limitations in access to healthcare technologies*” reflected two distinct factors: the theoretical availability of BC health technologies (their existence) and the actual access to these technologies within the local healthcare context. To make these meanings more precise, these VEs were refined and renamed as “*Availability of health technologies*” and “*Access to health technologies*”, respectively.

Discussions also provided deeper insights into how stakeholders perceive patient age as a societal VE for BC. Societies tend to be more sensitive toward younger populations, and so the term “young BC patients" emerged frequently in interviews, with participants attempting to define what constitutes “young”. While there was no difference in prioritizing healthcare initiatives for 25-year-old versus 40-year-old BC patients, special attention was devoted to women not only with paid work, building careers, but also with unpaid roles or future roles within their families as mothers, spouses, and caregivers. As a result, the VE was aptly named “*Age-related societal role of the patient*”.

**Table 2**
Value elements in the social framework.

| | **Literature-based conceptual model** | **Final validated conceptual model** |
|---|---|---|
| **Traditional value elements** | Survival/mortality | Survival/mortality |
| | Clinical outcomes | Clinical outcomes |
| | Adverse events | Treatment-related adverse events and toxicity |
| | Quality of life | Health-related quality of life of the patient |
| | Direct medical costs | Direct medical costs |
| **Patient-centric value elements** | Reaching important personal milestones | Reaching important personal milestones |
| | Patient experience | Patient experience related to disease management and health technology |
| | Patient empowerment | Health literacy of patients |
| | Adherence to therapy | Involvement of patients and caregivers in decision-making |
| | Uncertainty about treatment efficacy and safety | Uncertainty about the efficacy and safety of the health technology |
| | Real option value | Real option value |
| | Caregiver/family’s quality of life | Quality of life of caregivers and family members |
| | Household's financial burden | Financial burden of households |
| | | Value of hope |
| **Societal value elements** | Severity of the disease | Severity of the disease |
| | Access to healthcare solutions | Availability of health technologies |
| | Limitations in access to healthcare technologies | Access to health technologies |
| | Epidemiology of the disease | Epidemiology of the disease |
| | Age of the patient | Age-related societal role of the patient |
| | Goal of the therapy | Presence of the disease around us |
| | Indirect costs | Indirect costs |

Interview discussions revealed that BC is more than just a common disease with high incidence and prevalence rates. Participants highlighted that nearly everyone has personal knowledge about BC within their close circle through family members, friends, or colleagues, which has been elevated to broad awareness through substantial media coverage. These factors have contributed to a clearly articulated societal demand for addressing BC through multiple healthcare and social interventions. Interviewees identified education, legislation, and employment as key areas that should strengthen public responsibility for BC. To capture these perspectives, *“Presence of the disease around us”* VE was added.

The final validated conceptual model consists of 21 VEs, including five traditional, nine patient-centric, and seven societal VEs (Table 3). The SF has the potential to inform decision-making within and beyond the healthcare domain by supporting the evaluation of policies, health technologies, public and civil society initiatives in Hungary.

## 4. Discussion

October is a special month for advocates of BC initiatives and technologies globally, and millions of people wear pink ribbons to raise awareness for BC [15]. In Hungary, the BHAABC hosts a major annual public awareness event. It features a scientific symposium aimed at the general public, seeking to challenge the perception of BC’s severity and emphasize that a diagnosis no longer equates to a death sentence. In the evening, hundreds of patients, caregivers, healthcare professionals, responsible employers, and philanthropic funders of BC initiatives march through the pink-lit Chain Bridge, an iconic historical place of Budapest. Such civil society activities, primarily led by non-governmental organizations, advocate for survivorship, patient empowerment, and a more patient-centred BC care, and can even influence political commitment [16]. This role becomes even more critical, as despite significant advancements in health technologies and care for BC in recent decades, the disease continues to impose a considerable health, economic, and social burden. Addressing these challenges requires additional investment and attention from multiple stakeholders. To facilitate coordinated actions in BC, it is critical to understand the value of such interventions for all relevant stakeholder groups. Our research confirmed that the value of BC-related health technologies and public and civil initiatives can hardly be judged without an explicit list of VEs. Also, it became evident that in addition to traditional VEs, such as patient survival, quality of life, and healthcare costs, patient-centric and societal VEs contribute to the full value of any initiative.

The 21 VEs identified in our final SF are not equally important to all stakeholders and hold different meanings for specific patient subgroups. Consistent with previous research [17,18], our findings revealed a notable distinction between the impact of early and advanced stages of BC through several VEs. Participants recognized that survival rates are generally more favourable in early-stage BC than in advanced cases [19]. In terms of the “*Value of hope*”, several interviewees associated early-stage diagnosis with a greater chance of cure. Participants also emphasized differences in treatment and daily life between early and metastatic BC. Early-stage treatment typically involves a fixed, shorter therapy period and often lacks the cumulative burden of prior treatments and adverse events, resulting in a considerably lower impact on the quality of life [20,21], of both patients and their families.

Local considerations were taken into account to transform general VEs for BC from the scientific literature to specific VEs for the Hungarian

**Table 3**
Conceptual model for a social framework in breast cancer.

| | Value element | Identified themes | Quotes from interviews |
|---|---|---|---|
| **Traditional value elements** | Survival/mortality | Overall survival and mortality rates in breast cancer.The stark difference between early and advanced stages. | “It is completely different in the early stages; there are percentages showing the chances of recovery.""In the metastatic stage, it somehow needs to be communicated that the disease cannot be cured." |
| | Clinical outcomes | Progression-free survival. The recurrence of the disease. | "The patient is not safe; the disease can recur even after 20 years." |
| | Treatment-related adverse events and toxicity | The undesirable effects observed during treatment. | "I was bald for years." |
| | Health-related quality of life of the patient | The impact of the health condition and the medical interventions on the physical and functional, mental, and social well-being of the patient, such as pain, fatigue, problems with mobility and self-care, emotional distress, anxiety (due to fear of death, losing one's job, the reaction of friends and family), and increasing conflicts in social relationships. | "It pulled me into a spiral, I started to feel anxious in a way that was overwhelming.""Many people worry about losing their job during their illness."<br>“It [BC] is stigmatized." |
| | Direct medical costs | The cost of oncological treatment, surgical treatment, overall hospital treatment, and medicines, as well as the level of resource use of the healthcare system. In Hungary, all are covered by the National Health Insurance Fund. | "If there is no recurrence, the patient doesn't go back to the healthcare system, no new treatments, and costs are lower." |
| | **Value element** | **Identified themes** | **Quotes from interviews** |
| **Patient-centric value elements** | Reaching important personal milestones | Fertility preservation, becoming pregnant or/mother, major family events, going back to work, and building a career. | "It was a struggle. A struggle for a child.""How am I going to see my child graduate?""They can return to continue their career." |
| | Patient experience related to disease management and health technologies | The patient's interactions in the healthcare system (communication, support level from healthcare workers, time spent in healthcare), and experiences with the applied health technology (site of administration/travel needed, mode of administration of the health technology). | "The doctor’s attitude means an incredible amount."“There needs to be someone to guide patients through the process." |
| | Health literacy of patients | The specific knowledge and skills of patients to understand their own health conditions and related needs, and engage with healthcare systems and health technologies. Ranges widely among patients. | “We often meet patients from rural areas who have no questions at all.""The usual monthly self-examination around the 3rd-5th day of the cycle, if not every month, then at least every second month." |
| | Involvement of patients and caregivers in decision-making | Shared decision-making process. The role of active participation by both patients and caregivers. | "I had to decide whether to have both breasts removed or not. So, you must make truly life-changing decisions." |
| | Uncertainty about the efficacy and safety of the health technology | Lack of information/evidence, and related fear of what is going to be the outcome of an applied health technology, and how it will impact the patient's health condition and everyday life. | "The fact that I might refuse a treatment is precisely because of the uncertainty involved." |
| | Real option value | Extending life creates the opportunity to benefit from future health technologies. | "We are advancing in age, and the new future techniques and solutions might lead to better outcomes." |
| | Quality of life of caregivers and family members | How the disease and the state of the patient impact the everyday life (physical, mental and social aspects) of those around the patient. | "Many young men are left with one, two, maybe three children.""Children often need the support of a psychologist to be able to cope with their mother's disease." |
| | Financial burden of households | Transportation, food, and accommodation costs. Private health care services and nutrition. | "Families are not designed to rely on a single breadwinner.""I took her to therapy every day, but we did this entirely at our own expense." |
| | Value of hope | The preference for health technologies with the potential to offer outstanding outcomes (like a cure) | "Early-stage breast cancer can be curable." |
| | **Value element** | **Identified themes** | **Quotes from interviews** |
| **Societal value elements** | Severity of the disease | The perception of society on how serious / life-debilitating the disease is. | "The typical general perception is: - Cancer? - You are dead." |
| | Availability of health technologies | The existence of health technologies for a particular disease. | "There are therapies that can tame this disease." |
| | Access to health technologies | The rate at which existing health technologies are available. Barriers to access. | "A friend under 40 tried to book a mammogram in the public system.""In early-stage breast cancer, cure is at stake, so it really matters what treatment is given." |
| | Epidemiology of the disease | Prevalence and incidence of the disease, and the expected changes in its tendency. | "It is a very common disease." "Demographic trends, such as an aging society and the proportion of women.""Lifestyle and nutrition contribute to the trend." |
| | Presence of the disease around us | It covers i) a portion of society, having personal experience with the disease, ii) media noise and awareness level of the | "Everyone knows someone who has faced this disease." "It [the prevention and treatment of breast cancer] only works well if every segment of society contributes its part to it." |

(*continued on next page*)

**Table 3** (*continued*)

| Value element | Identified themes | Quotes from interviews |
|---|---|---|
| | disease, iii) an existing demand for comprehensive, cross-society action to tackle the disease. | |
| Age-related societal role of the patient | The expectations, responsibilities, and contributions that society associates with patients based on their age and gender. It covers womanhood, motherhood, role in the family/workplace, being a wife/partner, and sexuality. | "A young woman who is at the start or middle of her life, planning a family, or is the centre of a family, is much more significant to society."“Young patients are still working, paying taxes, having children, starting families. They are contributors to society." |
| Indirect costs | Productivity loss in paid work due to patient's and caregiver's absenteeism and presenteeism, the rate of patients leaving the labour market, time to return to work. Cost of the patient's absenteeism in non-paid work, like cooking, cleaning, and taking care of children and family members who need support. | "In most cases, the patient leaves the workplace, which is a significant burden to families and society.""Usually they [women] take care of sick people in the family." |

context. Consequently, our SF may not be directly transferable to other countries, especially those with very different beliefs, traditions, cultural environments, and economic constraints [22].

Several studies from other geographies have examined the value of BC health interventions through a range of conceptual approaches, often focusing on clinical, economic, or patient-centred factors relevant to decision-making. Research from a health-economic perspective primarily addresses traditional VEs [23,24], while other studies explore ways to incorporate patient perspectives and patient-centric criteria into decision-making [25–27]. Societal factors are generally assessed through analyses of disease burden and indirect costs [28,29]. Some of these studies limit their scope to specific categories of VEs or particular BC subtypes and stages. To our knowledge, no other study has systematically gathered and structured all VEs with potential relevance to multiple stakeholder groups across the full spectrum of BC initiatives.

### *4.1. Limitations*

Our study should be considered in the light of the following limitations. First, while we interviewed 24 participants from 6 stakeholder groups, the interview sample was not fully representative of the Hungarian society. For example, the absence of participants from vulnerable groups, such as individuals of Romani ethnicity, limits the inclusiveness of the findings. At the same time, the seniority and professional experience of the interviewees ensured that their input was substantive and covered the critical aspects of BC. Enlarging the number and diversity of involved stakeholder groups in future research could broaden perspectives and provide a more in-depth understanding of BC’s societal impact in Hungary. Second, defining and refining previously undefined terms in Hungarian posed notable challenges. Translating key VEs required careful contextualization to ensure consistency with international frameworks while reflecting the nuances of the Hungarian language and healthcare system. Even where suitable Hungarian terms exist, their use in practice is often inconsistent or underdeveloped. Multiple translations and interpretations of key concepts, such as health literacy, further complicate their application in healthcare and societal discourse. This variability underscores the need for standardized terminology and increased awareness to promote clarity and alignment across stakeholders in Hungary.

### *4.2. Future directions*

Further research is necessary to explore the priority ranking and relative weight of VEs in the conceptual model. Such research may highlight different opinions and preferences on VEs for each stakeholder group.

Due to its frequency, high awareness, and profound societal impact, BC is an ideal therapeutic area for pilot research and investigations. While the SF is specific to BC, our research methodology is generalizable to other public health priority disease areas.

The literature review may serve as a foundation for other countries to tailor the conceptual model to their healthcare systems and societal contexts with similar multi-stakeholder adaptation methods.

## 5. Conclusion

While BC is a priority disease area for all stakeholder groups, their views on what contributes to the success of policy decisions are different. If policymakers intend to represent the interests of the whole society, they should aim to express the value of policy interventions in a comprehensive SF. This study facilitated extensive engagement of diverse stakeholder groups through in-person interactions via interviews and on-site meetings, and fostered a genuine sense of cross-societal collaboration around BC. Our research represents a major step toward understanding the importance of BC and the value of BC-related health technologies and societal initiatives in Hungary. It lays the groundwork for further exploration and refinement of patient-centred strategies, civil society actions, and health, legal, and employer policymaking by highlighting the importance of inclusivity and cultural adaptation.

## Ethical approval

Ethical approval was obtained from the Hungarian Scientific and Research Ethics Committee (registration number: BM/14996–1/2024). Participants were asked to sign consent forms and data privacy statements to participate in the research.

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## CRediT authorship contribution statement

**Kalo Zoltan:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Methodology, Investigation, Formal analysis, Conceptualization. **Judit Tittmann:** Writing – review & editing, Resources, Investigation, Conceptualization. **Magdolna Dank:** Writing – review & editing, Writing – original draft, Validation, Supervision, Resources, Methodology, Investigation, Formal analysis, Conceptualization. **Szabo Borbala:** Writing – review & editing, Resources, Investigation, Conceptualization. **Matrai Tamas:** Writing – review & editing, Validation, Resources, Investigation, Conceptualization. **Zemplenyine Bartha Julia:** Writing – review & editing, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Kovacs Agnes Anna:** Writing – review & editing,

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## Declaration of Competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.jcpo.2025.100679.

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