

# **Integrating Users' Perceptions to Identify Features Indicating the Quality of Cancer-Related Podcasts Provided by Non-Profit Cancer Organisations**

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## **Abstract**

While cancer podcasts are valuable for support and information, there is a significant gap in understanding their quality features from users' perspectives. Understanding quality features from users' perspectives is important to ensure that cancer-affected people receive the support they need. This study addresses this gap by combining multiple theoretical perspectives: a. the IQ assessment framework, source credibility theory, two-factor theory of website design to assess the quality of podcasts, and b. reception theory to highlight listeners' perception of quality. These perspectives, together, enrich the concept of information systems quality and provide a comprehensive understanding of podcasts' quality. Through semi-structured interviews with 17 cancer-affected individuals, the research found that credibility, content, and design were essential quality features, with the visual appearance serving as a motivational factor. The integration of Reception Theory highlights users' active role in shaping quality perceptions, offering new insights into the effective design of cancer-related podcasts. This novel approach bridges a critical research gap, illuminating the complex interplay of technical and human factors in assessing podcast quality from the perspective of users.

**Keywords:** Cancer Podcasts, Information Systems' Quality, Reception Theory, Content, Credibility, Design.

## **1 Introduction**

The usage of a range of information and communication technology tools can contribute to the enhancement of the quality of life for users (Ractham et al., 2022). With the convenience of the internet, cancer-affected people can obtain healthy lifestyle advice, build a greater understanding of health issues, and make informed decisions about treatments (Lleras de Frutos et al., 2020). In a study that explored internet search patterns by cancer-affected people, McLeod et al. (2017) found that 85% of patients diagnosed with cancer use the internet to access information about their disease. However, health information on the internet is of varying quality (Hamzehei et al., 2018). In a study that examined the quality of 100 websites relating to pancreatic cancer, De Groot et al. (2017) found that many websites lacked up-to-date information and appropriate readability levels. Similarly, 32% of patients with thyroid cancer found that online thyroid cancer information could be barely understood (Chang et al., 2019).

Uncertainty about the trustworthiness and accuracy of online health information presents a barrier to health information use by users (Zhao et al., 2022).

Previous studies on website usage patterns showed that among the different sources of online cancer information, cancer-affected people tend to access information produced by non-profit cancer organisations (NPCOs) more than commercial (such as pharmaceutical companies) and government sites (Chang et al., 2019). Online resources provided by NPCOs cover a range of cancer topics including understanding cancer, emotions at early stages of diagnosis, cancer treatments, managing side effects, living well after cancer, complementary therapies, cancer questions and myths, and cancer stories (Mills & Millward, 2019). Many of these services and support are provided using different online support resources. Cancer podcasts are one type of resource provided by NPCOs to support cancer-affected people via audio in the form of interviews, conversations, and panel discussions (Scott et al., 2023).

Evaluation frameworks assessing the quality of health-related podcasts focused on examining podcasts' sustainability as supplementary tools for providing clinical and palliative care guidance for healthcare professionals (Nwosu et al., 2017), and supporting education on emergency practices such as paediatric (Zaver et al., 2016), neurologic (Grock et al., 2016), and respiratory medicine (Min et al., 2018). However, there is a dearth of studies researching the use of cancer-related podcasts by considering the perspectives of patients, survivors, and caregivers. Given that online information influences health-related decisions of cancer-affected people seeking online advice and confirmation of decisions (Gandamihardja et al., 2023), understanding the quality of cancer-related podcasts provided by NPCOs is important, because cancer-affected people are more likely to seek online support from NPCOs than from other sources (Chang et al., 2019). Moreover, less satisfaction with the information obtained about cancer is linked to reduced quality of life for cancer-affected people (Faller et al., 2017).

This study used the reception theory to gain a more comprehensive understanding of cancer-affected people's perspectives about cancer-related podcasts. Unlike traditional technological perspectives, the reception theory allows the research to explore the intricate details of human perception regarding these podcasts. By examining how the audience receive, interpret, and respond to the content (Hall, 2007), reception theory can complement Information Quality (IQ) framework and provide more comprehensive explanation. This approach transcends mere technological assessment and considers the listeners' diverse backgrounds, expectations, and emotional responses (Holub, 2013). In the context of cancer, where the information can have profound impacts on decision-making and well-being, understanding human perception is critical as it ensures that the information provided is not only accurate and appealing but also resonates with the intended audience. Thus, the application of reception theory in this research provides a new perspective that aligns with the human-centric nature of healthcare information, allowing for a more comprehensive evaluation of the quality of cancer-related podcasts.

Therefore, this paper aims to identify and examine features that indicate the quality of cancer-related podcasts provided by NPCOs from the perspective of cancer-affected people in their specific context.

Hence, the research question that guides this study is:

*What features indicate the quality of cancer-related podcasts provided by NPCOs and how do they resonate with cancer-affected people?*

This study contributes to the literature by providing insights into the quality indicators of podcasts provided by NPCOs from cancer-affected people's perspectives. The integration of reception theory with information quality enriches our understanding of the user's perception and communication strategies. Furthermore, the study provides evidence-based findings to inform the development of cancer-related podcasts by NPCOs that need to allocate scarce resources efficiently and effectively when designing and selecting the content of those podcasts, enhancing the podcasts' usability.

## **2 Literature Review**

Health-related podcasts are commonly used in a variety of health contexts to provide information to support patients and caregivers (Gopal, 2019), educate policymakers, researchers, and the public on palliative care (Nwosu et al., 2017), and provide continuous medical education for health practitioners (Berk et al., 2020). Medical practitioners working in emergency medicine use podcasts for the most up-to-date information and research for caring for patients (Grock et al., 2016; Min et al., 2018; Thoma et al., 2015).

With the increased use of podcasts in emergency medicine, the need for evaluating podcasts' currency and quality emerged (Thoma et al., 2015). Thoma et al. (2015) used experts in emergency medicine to identify quality indicators of emergency medicine podcasts. The taxonomy for quality used in that study was informed by the work of Paterson et al. (2015), which involved an international cohort of health educators refining a list of 151 quality indicators for medical education podcasts to 13 relevant quality indicators subcategorised into three major themes: credibility, content, and design.

However, none of the previous studies examined the quality of cancer-related podcasts used by cancer-affected people for obtaining emotional and informational support. Studies evaluating users' satisfaction with podcast technology focused on the opinions of medical practitioners using podcasts for medical education. For example, in a study that interviewed 16 users of emergency medicine podcasts, usability and convenience were the most reported features satisfying users followed by a sense of connectedness to the broader professional community (Riddell et al., 2020). Other perceived advantages of medical podcasts included increased comprehensibility and the acquisition of more knowledge when compared to traditional learning methods such as textbooks (Back et al., 2017).

Podcasts are convenient online resources for cancer-affected people to obtain information in different locations, such as while waiting at clinics for treatment, in the car, on public transportation or anywhere else. However, people are more likely to integrate the information from the internet into their health decisions if the quality and value of the health information meet their needs (Leung, 2008). The quality of online information can play an important role in positive outcomes. For example, relevant and sufficient information shared on a breast cancer website helped women with breast cancer make informed decisions relating to cancer treatments (Bruce et al., 2015). Therefore, it is important to understand features cancer-affected people consider essential when evaluating the quality of cancer-related podcasts provided by NPCOs.

## **3 Theoretical Framework**

Previous studies used different measures to assess the quality of online health-related resources. For example, Koo et al. (2011) classified the dimensions of quality into three main

streams: information quality, information presentation, and website attractiveness. In another study, Dubowicz and Schulz (2015) developed a framework that included the following dimensions: trustworthiness, competence, interference, layout, textual deficits, usability, and suitability. A more comprehensive framework is one developed by Paterson et al. (2015) who conducted a thematic analysis of existing studies on health-related podcasts and blogs to identify quality indicators for podcasts and blogs used by learners in the health profession. The study classified quality indicators into three main themes: the credibility of the resource, quality of the shared content, and the design/layout of the website displaying the online resource.

The three quality themes were further used in studies that investigated different audience groups, such as content producers to identify quality indicators for blogs and podcasts in emergency medicine and critical care (Thoma et al., 2015), and health educators to identify quality indicators for social-media-based medical education podcasts and blogs (Lin et al., 2015). Due to its comprehensiveness and frequent use in the context of health systems, this study adopted Paterson et al. (2015) taxonomy to explore the podcasts' quality dimensions from the perspective of cancer-affected people. The conceptual framework was developed using a multi-theory perspective that integrated the Information Quality (IQ) assessment framework (Stvilia et al., 2007), the source credibility model (Hovland & Weiss, 1951), the two-factor theory for website design (Zhang et al., 2000), and Reception Theory (Hall, 2007). The components of the conceptual framework are discussed in the following sections.

### **3.1 Podcasts' Quality Dimensions**

#### **3.1.1 Content**

This study used the IQ assessment framework by Wang and Strong (1996) to establish a model for quality indicators of podcast content. The IQ assessment framework consists of four main constructs capturing the following aspects: intrinsic, contextual, representational, and accessibility (Wang & Strong, 1996). Within the health context, Stvilia et al. (2009) extended the IQ assessment framework to establish an evaluation tool for assessing health information quality that included five basic criteria: accuracy, completeness, authority, usefulness, and accessibility. Incorporating dimensions from the IQ assessment framework and following a literature review on health information quality, this study included accuracy, relevancy, usefulness, completeness, richness, currency, and interpretability as proposed dimensions of the podcast content quality.

##### *3.1.1.1 Accuracy*

*Accuracy* refers to the degree to which the information is correct and free of errors (Koo et al., 2011). Koo et al. (2011) defined the accuracy of the shared cancer information in terms of the extent the information is consistent, believable, meaningful, unambiguous and correct. This study sought to determine whether accuracy is considered important by cancer-affected people when evaluating the quality of cancer-related podcasts. Therefore, we need to understand the extent to which quality is impacted if cancer-affected people feel misled by false or conflicting opinions or statements (Bernstam et al., 2008) shared on cancer podcasts.

##### *3.1.1.2 Relevancy*

*Relevancy* refers to the extent to which the shared information covers topics of interest pertinent to the informational needs and questions of people with health-related concerns (Kanthawala

et al., 2016). In a study designing an online patient education resource to manage chronic diseases, patients reported preferences for information tailored to their symptoms, guidance on self-care strategies and advice on personal treatments (Win et al., 2016). However, the lack of sufficient resources can constrain NPCOs from providing personalised advice to online users. This study examined the extent to which it is important that information shared on podcasts covers topics relating to the interests and needs of cancer-affected people.

#### 3.1.1.3 Usefulness

*Usefulness* refers to the extent to which the information is able to provide a better understanding of specific health issues, enabling users to make informed and accurate health decisions (Li et al., 2018). Cancer-affected people found that useful information obtained from cancer forums offered help, advice and emotional support (Hargreaves et al., 2018). In a study evaluating the effectiveness of a Web-based educational program for breast cancer, the usefulness of information was the most influential factor for users' satisfaction compared to other factors such as system design, system convenience, adequacy of information and system efficiency (Yi et al., 2008). Given the positive impact of the perceived usefulness of health websites on users' intentions to use those websites (Li et al., 2018), this study included *Usefulness* in the conceptual framework for quality indicators of podcasts.

#### 3.1.1.4 Completeness

*Completeness* refers to the extent to which the resource provides the right scope and amount of information that is sufficient (Boon-itt, 2019; Fadahunsi et al., 2019) to fulfil the specific needs of cancer-affected people. Online health information is incomplete when it is unable to provide sufficient explanation to cover all aspects of a particular issue and lacks logical links (Dutta-Bergman, 2004). Even if online health resources are accurate, this does not necessarily indicate that the information is complete. For example, in a study assessing the completeness of online pancreatic cancer information, De Groot et al. (2017) assigned low completeness scores for cancer websites that did not necessarily provide inaccurate or incorrect data, but that did not demonstrate the full picture by failing to include important information.

Therefore, *Completeness* of the information is included in the conceptual framework as one component of the quality content to examine whether accessing sufficient information on podcasts associated with in-depth explanations of cancer topics sought by cancer-affected people is essential for using those online resources.

#### 3.1.1.5 Richness

*Richness* refers to the extent to which the resource covers a wide range of information explained in an in-depth manner (Kim & Mrotek, 2016). Zheng et al. (2013) defined richness of information in terms of depth, diversity and volume. In the Kim and Mrotek (2016) study, two factors were used to assess the richness of information shared in an online health community: topic breadth and topic depth. Topic breadth refers to the extent the online community provides a wide range of topics or includes several categories related to a specific health topic (Kim & Mrotek, 2016). Topic depth refers to the extent to which the online community discusses topics in an in-depth manner or provides links redirecting health consumers to external websites that offer rich information on a given topic (Kim & Mrotek, 2016). Therefore, *Richness* is included in the conceptual framework for quality indicators of podcasts to examine

whether richness is vital for cancer-affected people seeking a wide range of cancer information and emotional support from those resources.

#### 3.1.1.6 Currency

*Currency* refers to the extent the information is up-to-date and available when needed (Almutiry et al., 2013). *Currency* is one of the core quality dimensions of health-related information (Liaw et al., 2013). Given the advances in cancer therapies, the progress of research on cancer screening and prevention, and information shared at a rapid pace (Heymach et al., 2018), obtaining up-to-date information is very important for cancer-affected people because health-related decisions are time-sensitive and influenced by this data (Huber et al., 2017). It is not clear to what extent cancer-affected people require the content shared via podcasts to be up-to-date and provide cutting-edge knowledge on cancer. Therefore, this study includes *Currency* in the conceptual model to understand how users judge the timeliness of the shared data and whether *Currency* indicates the quality of those resources.

#### 3.1.1.7 Interpretability

*Interpretability* refers to the extent the information meaning is sufficiently explained by using terms that are easily comprehended (Almutiry et al., 2013; Laranjeiro et al., 2015), and whether it is communicated at an appropriate understandable level, free of jargon and complicated medical terminology (Win et al., 2016). The readability of cancer websites has been extensively researched by scholars and health experts to determine the level of understandability of cancer information shared on these websites (Arif & Ghezzi, 2018; Lynch et al., 2017). Monton et al. (2019) used an online analysis tool that provides several indices to indicate the comprehension level of online cancer resources for family caregivers and found that 93% of the resources require a ninth-grade educational level to understand the content. In a different study, Bates et al. (2007) found that improving the comprehension level of online health information had no impact on users' evaluation of the quality of health information. Therefore, we need to understand whether cancer-affected people perceive *Interpretability* as an essential feature indicating the quality of cancer podcasts.

### 3.1.2 Credibility

According to the source credibility theory, the receiver's acceptance of the message is determined to a large extent by the communicator's characteristics and level of trustworthiness in the resource (Hovland & Weiss, 1951). The two major elements of the source credibility theory are trustworthiness and expertise (Hovland & Weiss, 1951). These two dimensions are integrated into our established framework as shown in Figure 1 and explained further below.

#### 3.1.2.1 Trustworthiness

*Trustworthiness* refers to the user's perception of the level of honesty, integrity, transparency and decency of the resource (Choi, 2015; Lowry et al., 2014). Hooda et al. (2023) revealed that enhanced quality of technological tools, encompassing service quality, information quality, and system quality, has the potential to augment trust in online resources. Previous studies have assessed the trustworthiness of online health information by asking online users to evaluate the extent to which they perceive the resource to be informative, convincing, trustworthy, truthful, transparent and decent (Choi, 2015; Dubowicz & Schulz, 2015; Mun et al., 2013). The study by Khan et al. (2021) revealed that perceived trust plays a vital role within

technological platforms, reducing healthcare professionals' concerns and risks associated with communicating personal and vulnerable health information.

The trustworthiness of online health information is influenced by the origin of the operator (the organisation maintaining the health website); its ultimate purpose (reasons for running the website); and commercial implications (committed to profit or social benevolence) (Choi, 2015). For example, participants in the study by Choi (2015) reported that health information offered by non-commercial organisations was more credible than information shared by organisations driven by profit purposes.

Previous research showed that the level of trust in online health resources has a positive impact on behavioural, affective and cognitive health outcomes for users of the information (Robertson-Lang et al., 2011). This indicates that trust may constitute a quality indicator of podcasts. Therefore, further investigation is required to understand whether cancer-affected people identify *Trustworthiness* as a critical dimension for using those resources.

### 3.1.2.2 Expertise

*Expertise* refers to the communicator's competencies, skills, knowledge and level of performance within a specific domain (Choi, 2015). Prior research has shown that the expertise of the knowledge contributor is a key factor impacting users' judgement of the believability of the shared information (Jung et al., 2016; Ma & Atkin, 2017). In a study identifying the quality indicators of health-related podcasts, experts believed that transparency is a key dimension of the source credibility and includes items such as listing communicators' qualifications and affiliations, providing details of the authors who created the resource, mentioning the origin of information by citing references, and referring listeners to additional resources (Thoma et al., 2015). This study aims to understand cancer-affected people's perceptions of the importance of the source expertise and how this influences their decisions to continue using podcasts. Hence, *Expertise* is included in the conceptual framework for quality indicators of those resources.

### 3.1.3 Design

Zhang et al. (2000) developed the two-factor model for website design to identify the design factors that enhance the usability and serviceability of the website and increase users' satisfaction and motivation to revisit the website. The two-factor model for website design identified several categories and core features classified as either hygiene or motivational (Zhang & Von Dran, 2000). The presence of hygiene factors encourages users to stay with the website and the absence of those features may lead to users' dissatisfaction and potential abandonment of the website (Zhang et al., 2000). Motivational factors, on the other hand, make the website look more appealing and increase users' motivation to visit the website, yet the absence of those motivational features would not discourage users to access and revisit the website (Zhang & Von Dran, 2000). This study included navigation, accessibility, and aesthetics as proposed dimensions of the design factor of cancer-related podcasts and the webpages displaying them.

#### 3.1.3.1 Navigation

*Navigation* refers to the extent to which an online resource provides tools for users to facilitate the location of information (Brower, 2004; Zheng et al., 2013). The navigational structure of an online resource includes the links and hyperlinks the resource offers, navigational instructions

and menu, site maps, help functionality, search engine and information organisation (Hajli et al., 2015; Thoma et al., 2015; Whitten et al., 2008; Zhang et al., 2015; Zhang, 2010). To improve the functionality of navigation tools, such as the search engine, Islam and Rahman (2017) suggested tracking users' most browsed activities and upgrading search engines by enabling the most searched items and favoured topics to be viewed first. Therefore, *Navigation* is examined as one dimension of the design factor in the conceptual framework for quality indicators of cancer podcasts.

### 3.1.3.2 Accessibility

*Accessibility* refers to the extent to which the information can be easily accessed without exerting relatively high effort (Zheng et al., 2013). Zheng et al. (2013) assessed accessibility by examining whether elements of an online resource (graphics, texts, etc.) can be quickly downloaded and visible. In a study on quality indicators of health educational podcasts, accessibility was measured by the degree to which the podcast loads and responds quickly, does not undergo significant downtimes by being available most of the time, can be accessed using multiple devices, is compatible with multiple operating systems and browsers, and is well-maintained to support the functionality of multimedia components and hyperlinks (Thoma et al., 2015).

Therefore, integrating cancer-affected people's experiences and opinions about the accessibility of online resources is crucial to understand whether accessibility indicates the quality of podcasts. This is because the viewpoint of scholars and experts can be different from the viewpoint of cancer-affected people, who are the direct users of those resources. Accordingly, *Accessibility* is included as one dimension of the design factor in the conceptual framework for quality indicators of podcasts.

### 3.1.3.3 Aesthetics

*Aesthetics* refers to the extent to which the online resource feels and looks good by having an appealing and easy-to-follow layout and appropriate and relevant images (Zhang et al., 2015). Different criteria have been used in studies assessing the aesthetic state of online health resources. For example, Koo et al. (2011) assessed the aesthetic state of an online cancer information site by measuring the attractiveness of the screen layouts, use of colours, screen background and patterns, and multimedia content to understand the impact on users' satisfaction and perceived usefulness. In another study, Kim and Mrotek (2016) used the modified version of the aesthetic scale that includes four dimensions: craftsmanship, colourfulness, diversity and simplicity (Moshagen & Thielsch, 2013) to assess the aesthetic state of an online health community.

Cancer websites with poor aesthetic states are dissatisfying to cancer-affected people. For example, small font sizes of an online cancer resource added difficulty for reading the text by older cancer patients, who reported several shortcomings in the layout of the cancer website (Bolle et al., 2016). Accordingly, *Aesthetics* is included as one dimension of the design factor in the conceptual framework for quality indicators of podcasts. All dimensions mentioned above for content, credibility, and design factors are illustrated in Figure 1.

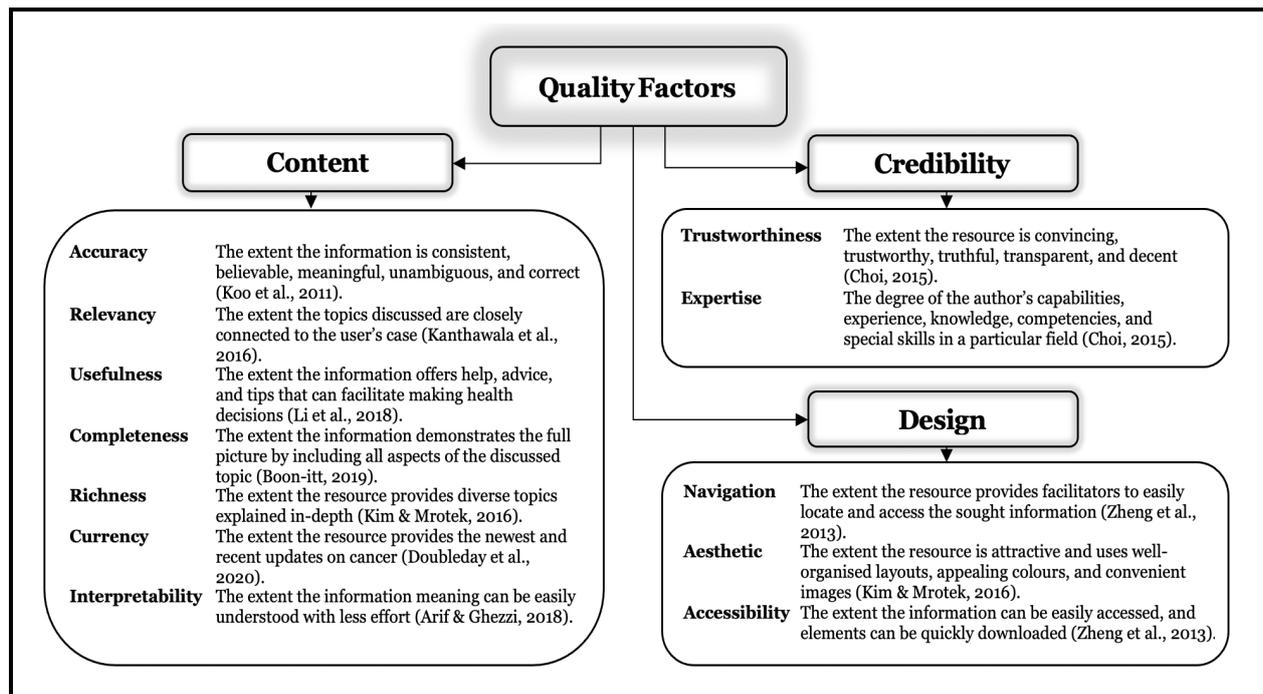


Figure 1. Quality Dimensions of Cancer-Related Podcasts

### 3.2 Audience Reception

Although assessing information quality by focusing on the information and information systems can be beneficial, it cannot provide a comprehensive perspective without considering audience perceptions (Salaün & Flores, 2001), in this study, users. Considering audience or users' perceptions is particularly important in the context of this study as cancer-affected people are more vulnerable, with variable information needs, and exposed to various types of risks and misinformation (Badreddine et al., 2023). The inclusion of reception theory provides a more nuanced understanding of the perception of cancer-affected people using podcasts.

Reception theory is a critical approach in literary studies and sociology that focuses on the audience's experience and interpretation of a text or piece of media (Hall, 2007). Rather than emphasising the author's intent or the text's inherent meaning, reception theory centres on the reader's role in constructing meaning. It acknowledges that audience bring their unique backgrounds, experiences, and perspectives to a content, and these elements shape their interpretation. By examining how different audiences may respond at different times and in various cultural contexts, reception theory offers a dynamic understanding of how meaning is created and negotiated (Willis, 2021). Over time, the application of the theory has been extended to other areas and disciplines including information systems (Ma, 2002). In the context of this study, cancer-affected users perceive the quality of podcasts from different perspectives depending on their specific settings.

Reception theory focuses on the processes of transferring meaning from creator to audience of creative work. This process includes encoding, where the sender crafts a message with shared rules and symbols, and decoding, where the receiver must understand the message as it was intended by the encoder (Hall, 2007). Furthermore, by considering their demographics and cultural background, the theory identifies three categories of audiences: i. Dominant (who interprets a text or media work in the way that the creator intended); ii. Negotiated (who accepts the creator message despite being against their personal convictions); and iii.

Oppositional (who interprets a content in a way that is fundamentally in conflict with the creator's intended meaning or the dominant cultural values).

Previous studies used the reception theory to examine podcasts as a form of creative work and investigated various types of reception in survivors of domestic violence (Boling, 2022) and students (Kitamura, 2021). Within the domain of health communication, the literature has also placed emphasis on the examination of perceptions held by diverse vulnerable populations, exploring the multifaceted perspectives and experiences of these individuals (Chen, 2020; Rennick-Egglestone et al., 2019). Reception theory is a good fit for this study because it provides a more nuanced understanding of perceptions of the three quality factors of cancer-related podcasts from cancer-affected people who need access to resources and support depending on their individual context, for example, where they are on their cancer journey. Consequently, the integration of the three theories of information quality with reception theory to examine how diverse audiences perceive various dimensions of information quality constitutes the conceptual framework that guides this study. Figure 2 illustrates this integrated model.

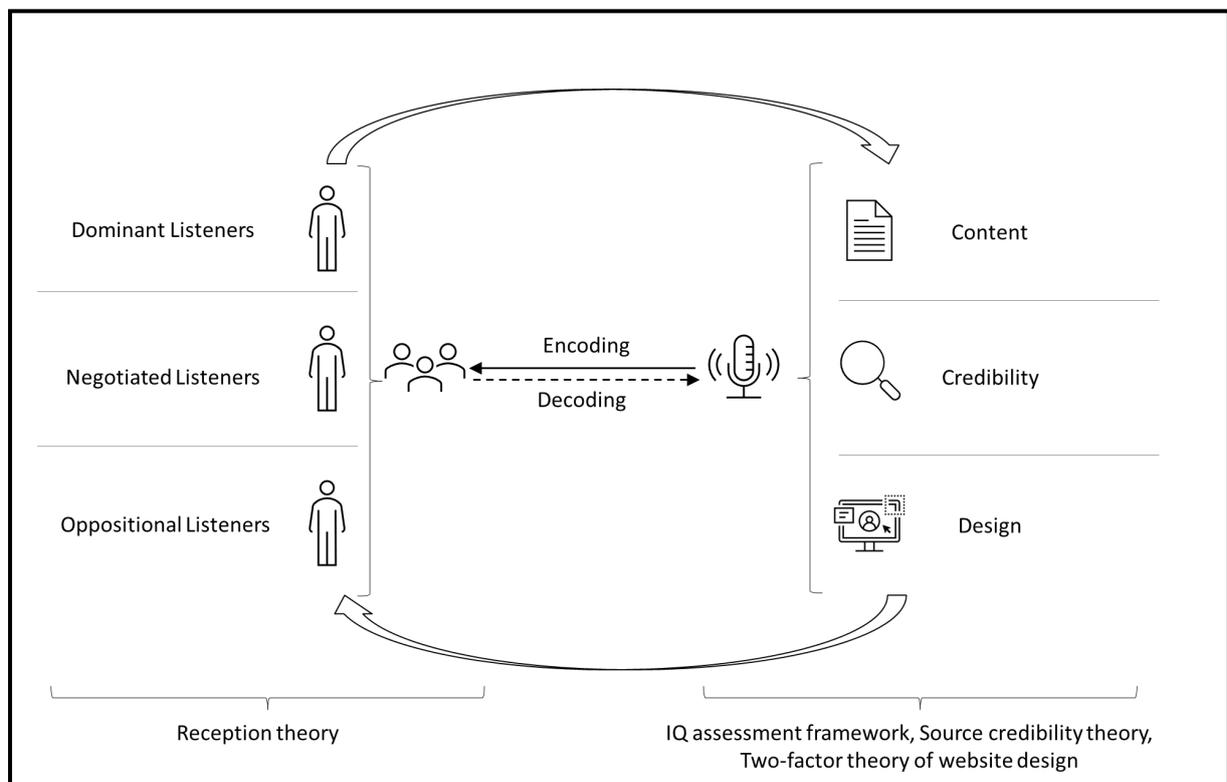


Figure 2. Conceptual Framework on podcast quality

## 4 Methodology

This study adopted the qualitative research design by using the narrative approach to extrapolate raw data from spoken stories of users' experiences as a source of empirical knowledge (Butina, 2015). The narrative approach includes diverse viewpoints from a varied range of participants that may result in different interpretations and new themes when analysing the narrative context (Butina, 2015). The qualitative methodology was suitable to allow the researcher to acquire a depth of understanding of cancer-affected people's subjective experiences of using podcasts.

Semi-structured interviews were conducted with 17 women affected by breast cancer who are users of the podcast series by Breast Cancer Network Australia (BCNA)<sup>1</sup>. Participants were recruited via an advertisement published on the BCNA website. Cancer-affected people were eligible to participate if they understood English, were at least 18 years of age, and had used or are still using the podcast series.

The interview questions were adapted from previous studies that examined the quality of online health information. The interviews ranged between 30 and 45 minutes, were conducted via zoom or phone, and were digitally recorded with the interviewee’s permission. The demographic data of the study participants are shown in table 1 below.

Demographic Variable	N	%	Demographic Variable	N	%
<b>Gender</b>			<b>Age</b>		
Female	17	100%	35 – 44 years old	3	17.5%
<b>Cancer Status</b>			45 – 54 years old	3	17.5%
Cancer Patient	9	53%	55 – 64 years old	9	53%
Post Treatment	7	41%	64 years old or above	2	12%
Carer	1	6%	<b>Length of usage time</b>		
<b>Diagnosis</b>			< 1 year	8	47%
DCIS	5	29%	1 - 2 years	5	29%
Early Breast Cancer	10	59%	> 2 years	4	24%
Metastatic Breast Cancer	2	12%			

*Table 1. Demographic data of the study participants*

Collecting data from 17 participants was sufficient to reach data saturation when variation in the collected data levelled off and no new interpretations and ideas were added (Francis et al., 2010). The interview material was transcribed and loaded into NVivo12 for additional processing and analysis. Thematic analysis was used to analyse the interview data, comprehend all parts of the interview texts, and describe themes and patterns in this study (Pope & Mays, 2019). After analysing the interview transcripts, the researchers were able to reconstruct and reduce the data by filtering out unnecessary conversations and selecting the perceptions that may corroborate key interpretations and findings (Miles et al., 2014). The data set was then reduced to meanings to generate abstract findings and extract themes (Pope & Mays, 2019). The data was first analysed using the IQ assessment framework, source credibility model, and two-factor theory for website design. Secondly, the data was analysed using reception theory for the thematic analysis and categorisation of interviewees.

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<sup>1</sup> Breast Cancer Network Australia is a not-for-profit organisation that supports Australians affected by breast cancer. BCNA aims to ensure that Australians affected by breast cancer receive support, information, treatment and care appropriate to their needs. With the opportunities that digital innovation is creating, BCNA has launched podcast series named “Upfront about Breast Cancer” including several episodes featuring different cancer topics to help cancer-affected people during treatment and beyond. Listeners can also refer to transcripts of podcasts if they are having trouble understanding a topic or if they want to refer to a piece of information later by scanning the transcript rather than listening to the audio. Each episode is labelled with a title that describes the discussed topic and lists all the related resources that offer the appropriate support.

## 5 Findings

The analysis of qualitative data offers a rich and nuanced understanding of cancer-affected people's perceptions on various dimensions of podcast quality. Also, through in-depth analysis of transcribed data, we were able to uncover new themes and patterns that shed light on the complexities of the quality of podcasts. Each interview was analysed to classify interviewees into three categories of audience. Dominant listeners are those individuals comprising a substantial portion of the study participants who consistently conveyed strong positivity regarding the quality aspects of podcasts and satisfaction with their usage. Negotiated listeners are those individuals who held a somewhat favourable view of podcast quality but suggested that their reuse would be contingent upon improvements in specific dimensions. In contrast, oppositional listeners held a negative view of most of the podcasts' quality dimensions. They either harboured mistrust or found the content and design to be subpar. This section presents the main findings of the study, organised according to the key themes under investigation.

**Accuracy:** Participants reported that obtaining flawless and reliable information is an important factor when deciding to use podcasts. Participants agreed that accurate data is the key to effective decision-making, and that inaccurate data places patients at risk of obtaining inadequate care and worsening their health. Users tended to compare what they knew about the medical condition and what their doctors informed them with information available through podcasts to confirm the accuracy of information. Users who believed that the shared data was inaccurate intended to stop listening to the podcasts. For example, a cancer survivor mentioned that:

*There are a lot of grey areas. I felt that it wasn't validated from my experience... I think it was biased data and not a true picture, as the speaker put the experience in a box with no room for other people's experiences. I would not refer any of my friends to listen to this series of podcasts.*

**Relevancy:** Users felt well-informed and more confident discussing knowledge obtained through podcasts with their doctors, particularly when the information was relevant and directly related to their situations. Participants preferred listening to podcasts that gave them a sense of their own treatments and diagnosis. Those users are more willing to listen to podcasts that share information tailored to their symptoms and particular conditions. Participants believed that off-topic and irrelevant podcast messages were less useful in making health decisions and would discourage them from listening to those podcasts. To illustrate this point, a cancer patient said:

*That's very important to me because I'm triple negative so a lot of information about breast cancer is about hormone receptors and postmenopausal women, and circumstances that don't match with my diagnosis. So, when I find stuff that is relevant, I absolutely love it and delve into it.*

**Usefulness:** Participants stated that they are more inclined to use podcasts that can help them expand their knowledge and make better health-related decisions. Users thought that using the podcast to validate information obtained from medical specialists made its usefulness more apparent. Users are more likely to use podcasts offering valuable advice, stress-relieving remedies, and dietary guidance. Participants responded that if the shared knowledge via the podcasts becomes less useful and does not provide appropriate practical tips, they will less likely listen to the podcasts. For example, a cancer patient noted that:

*... certainly, the last series of podcasts with Charlotte Tottman was useful, perhaps because she was a psychologist, I found that particularly helpful... and even for some of the strategies she mentioned, I would use going forward.... If the info was not helpful, I just wouldn't bother to listen.*

**Completeness:** Participants believe a podcast is incomplete if it does not provide sufficient explanation to cover all aspects of the discussed topic. Participants stated that even if the podcast shared factual data, it might not be complete since it didn't show the entire picture by excluding key information. One listener regarded the podcast's material as "incomplete" since it concentrates on the speaker's unpleasant experiences while ignoring the positive aspects. This participant believed that the shared material is harmful to women with breast cancer since it does not depict the entire picture which should include both positive and negative experiences. Another cancer patient said:

*... that's why I kept listening to it and that's because it gave me so much. It just helped me to know the many aspects of my cancer, you know everything from treatment and dealing with treatment and the side effects of treatment... and everything.*

**Richness:** Some participants reported that detailed explanations of the podcast topics were beneficial and valuable, especially since discussions with doctors focused on a narrow range of cancer-related topics as opposed to a broad range. Another participant, on the other hand, complained that the podcast series lacked diversity because they all shared similar themes. As a result, they were less interested in the quality of podcasts that covered narrow subjects. To illustrate this point, a cancer patient stated:

*When I was first diagnosed, I was greedy for information. I prefer a wide range of cancer topics ... every time I've been worried about something like my nails started falling off, I'd be able to go to the one that talks about side effects from radiation or chemo and be able to get that bit to reassure me. If there was a link under the podcast that provides additional data on this, that'll be fantastic.*

**Currency:** The study participants felt that getting the most recent information is crucial for cancer-affected people because cancer therapies are improving, research on cancer screening and prevention is advancing, and information is being shared at a rapid rate. They held the opinion that having access to current information can facilitate making timely health-related decisions that are consistent with the most recent developments in cancer care and treatment. For example, one cancer survivor said:

*I just don't think it's worthwhile listening to outdated information if the studies they're citing are really old because research is moving so quickly and there are so many new things... when my mom had breast cancer 30 years ago she was told to go home and rest after treatment, whereas now they'd say try and keep moving as much as you can and so if you're told to go home and rest when the current research is to keep moving, it's kind of worthless.*

**Interpretability:** Participants expressed a preference for podcasts that succinctly deliver the subject issues and share information that can be comprehended with less effort. Participants thought that individuals without a background in medicine would benefit from having a glossary of terms. According to one participant, it is challenging to have authoritative information without complicated medical terms and jargon because they form an essential component of it, but the information must be clearly communicated using simple terms. Participants claimed that they would quit listening to podcasts that are difficult to understand. To illustrate this viewpoint, a cancer survivor said:

*I just would not listen to it if it's totally incomprehensible to me. I don't mind people using medical terms, because if you are in a medical situation, you probably should know them, but they need to be explained .... when it's an early diagnosis thing, where you haven't heard these terms or you have heard them, but you can't remember what they mean, a glossary of terms would be very useful. Because there's so much to take in at the beginning and you're tired of usually you got stuck on the fact that you got cancer and can't remember all the other stuff ...*

Within the content dimension and focusing on reception theory, the data was mapped to the various types of audiences highlighted in this theory, that showed:

**Dominant or Hegemonic listeners:** Those individuals formed a significant portion of those who were interviewed (11 out of 17). They generally indicated a full acceptance of the podcasts' content as they believed in the accuracy of whatever coming from a reputable source:

*Anything that BCNA does is usually very good very well researched, and they also usually use really prominent people in the fields.*

Dominant listeners believed that the content of the podcast enhanced their ability to cope with cancer and gain more knowledge:

*I guess it made me feel empowered that I knew so many little things now I have all of these tools that I can use to make myself feel better.*

**Negotiated listeners:** Four interviewees provided less favourable assessments for specific dimensions of the content quality. While they agreed with certain dimensions, they also expressed reservations or recommended adjustments. In particular, they identified situations where the podcast's content omitted crucial information and occasionally lacked clarity in its interpretation.

*It doesn't tell you about the good stuff and how you can change your life and how great it is to change your life to be more healthy. It's certainly had a similar theme every episode and I'd probably like to see more maybe diversity.*

The results of our analysis revealed that three individuals within this category come from a medical background and possess extensive experience in dealing with cancer. This background and experience influenced their evaluation of the content quality of these podcasts:

*I've got a science background, I like to know the science behind things so during my treatment, I wanted to know exactly what was going on and so that's vital. I wouldn't be dialling in if it was a winch fist of people who didn't know what they're talking about.*

**Oppositional or counter-hegemonic listeners:** Two interviewees held a negative view of the podcast content and expressed reservations about most dimensions of the content quality. The predominant reason for this oppositional perspective stems from their emotive reaction to the auditory material they were exposed to. These users indicated their intention to avoid podcast episodes that exhibited bias and conveyed information perceived as less accurate and less useful. For example, a listener criticised the reliance of the host on her own experience by saying:

*I took offense to that her experience was a blanket experience and everybody is dying to experience what I did; and it is going to be hard, and I think that is a myth; it doesn't have to be a difficult hard experience!*

**Trustworthiness:** Many participants stated that they would generally have faith in the information supplied via podcasts if those resources were run by reputable institutions including charities and the government. Participants said they trusted podcasts that offered objective medical advice, directed listeners to other credible sources, included information on the data originator, and disclosed any conflicts of interest. For example, one cancer patient said:

*I think I trust it because it is coming from BCNA which is a reputable source of information. It's probably the premier website that breast cancer patients in Australia would use. So in fact, there's probably quite a lot of faith and expectation there that their information is accurate and trustworthy and that you're not going to be led astray.*

**Expertise:** Participants noted that the calibre of the podcast host has an impact on how much users trust the information presented, especially when it comes from licenced medical professionals like doctors. According to users, it is crucial to introduce the podcast guests and outline their credentials at the beginning to demonstrate their suitability to discuss the subject at hand. When the communicator is subjective, listeners have expressed intentions to stop using the podcast. For instance, one cancer survivor said that because podcasts were constrained by the values of the physician or the person delivering the message, they are unlikely to be listened to in the future. Another cancer patient said:

*Well, I mean when I'm listening to someone, I want them to either have experience of breast cancer themselves or have medical knowledge about cancer. Because that's the type of information that I would trust. I think that's why specific podcasts really appealed to me because the speaker had that level of experience herself, but she also had an original angle.*

By considering the three audience categories, an analysis of the podcast users' perceptions of the credibility dimensions was conducted, revealing the following results:

**Dominant or Hegemonic listeners:** 12 out of 17 listeners mentioned that they place trust in the podcasts' content. They believe that reputable sources, such as BCNA, diligently seek the opinions and advice of experts when selecting speakers to convey messages through their podcasts:

*I've got full faith that BCNA are kind of doing that due diligence prior to getting their speakers involved.*

**Negotiated listeners:** Three interviewees held neutral views regarding the podcast's credibility dimensions. For example, one individual preferred to apply their own validation of data before trusting it blindly even if it were generated by a reputable source:

*I guess it's more about the multiple levels of checks and balances which are useful, rather than one source of information.*

**Oppositional or counter-hegemonic listeners:** Two interviewees lacked trust in the podcasts' content and perceived the speakers as biased, primarily focusing on their own experiences. This tendency sometimes made them feel that the content is unsettling and less reassuring. For instance, one listener critiqued the host's attitude, stating:

*Well, one of them, that really made me angry was the one on and I can't remember it was on sexuality and intimacy. I think that was cold and it was the speaker's experience and she quoted statistics to say that after treatment and maybe during while you're having hormone blockers ... you don't orgasm anymore.*

*I suppose the podcast scared me. I got really scared and I didn't want to believe that this is true, so I got a naturopath and I started taking B12 and it helped yeah.*

**Navigation:** Participants believed that the podcast webpage is well-designed if it has a navigation system that works consistently across the entire website and offers tools for finding the content quickly. For instance, one participant mentioned that the authority and reliability of the podcast can be determined by how well-designed the navigation system is. Participants advised that a title that clearly describes the podcast's subject is very helpful. Users acknowledged losing interest if the links and hyperlinks of the podcasts were not adequately maintained and expressed frustration with less powerful search engines. To illustrate this point, a cancer survivor said:

*If it was too hard to navigate the website to find them, I would just give up, especially if it took longer than a minute, then I wouldn't be actually keen. Everyone wants things to be easy, particularly when you are first diagnosed and you're looking for information. You know there's a lot of stuff going on as well, you just want it to be easy enough.*

**Accessibility:** Podcasts that load and respond quickly were favoured by participants. They expressed dissatisfaction with podcasts that undergo lengthy outages and are not constantly available. They claimed that listening to podcasts using various devices is convenient, especially since they can do so from any place. Participants favoured podcasts that worked with a variety of operating systems and browsers and were well-maintained to support the functionality of multimedia elements and hyperlinks. To illustrate this point, a cancer patient noted that:

*Basically, accessing them from various devices is very important so you can listen to them anywhere on your mobile phone or tablet... if you are very eager and keen to listen to a certain podcast and then it just went down, yeah, I'd be pretty annoyed.*

**Aesthetic:** Users thought that a visually appealing website is one that contains convenient pictures, fonts and colours that complement the concept of the website and link better to the theme. Although the inclusion of those features would boost users' satisfaction with the website, users said that the aesthetic appeal of the website has no bearing on their choices to continue using the podcasts. The participants found the podcast transcripts to be helpful and preferred the audio speech to be at a reasonable pace and speed. One participant, for instance, described how they gave up and stopped listening to podcasts issued by another charity because the audio was delivered by a very rapid speaker who was attempting to convey a complicated topic using complex medical terms. Additionally, some participants mentioned how crucial it is that the voice can be clearly heard without exerting too much effort to continue listening. To illustrate this point, a cancer patient stated:

*The pace and speed of speech are very important. I think if you feel rushed through it that doesn't really work. I tend to talk quickly when I'm nervous and I think a lot of people do and it's irritating as a listener, to listen to somebody who's talking quickly because you keep missing stuff. Whereas people that are experienced podcasters sort of measured and slower than normal talking and it just seems to work a lot better. Also, a clear voice recording is critical to my understanding of it, to be able to make sure that you are following along with the information that comes through.*

The perceptions of the three categories of audience regarding the design dimensions of the podcasts were as follows:

**Dominant or Hegemonic listeners:** 12 out of 17 individuals were pleased with the podcasts' design, finding the podcast website easy to navigate and user-friendly. They held a neutral stance regarding the visual aesthetics of the website:

*Everyone wants things to be easy and, particularly when you are first diagnosed and you're looking for information. You know there's a lot of stuff going on as well, you just want it to be easy enough that's, the only thing that's easy in your day it just makes a difference.*

*I wouldn't say that the colours and images are as important as the audio quality.*

**Negotiated listeners:** Two interviewees expressed less satisfaction with the podcast's navigation system and accessibility. For instance, those individuals expressed a preference for more detailed descriptions of the podcast topics and found the website somewhat challenging as they encountered difficulties in locating specific podcast. They noted that the visual aesthetics of the podcast website held minimal significance and did not influence their intentions to continue using it. For example, they mentioned:

*I did find it a little bit hard so when I'm looking for a specific topic, you know look up peeling nails or something, and you get you know 5 million hits and so I tend to sort of stop using those resources.*

*I found it very hard to find it as a resource to begin with, so it was not made kind of find out that BCNA even existed.*

**Oppositional or counter-hegemonic listeners:** Similar to the opinion of the other two categories of audience, three oppositional listeners did not place significant importance on the visual appearance of the podcast website. This aligns with the finding that the aesthetic aspect in terms of the colour and theme of the podcast website serves as a motivator, as its absence does not deter users from listening to the podcasts. Nevertheless, within this group, two individuals were reluctant to access podcasts that required a substantial amount of time to navigate or featured an unacceptable pace of audio speech:

*... fairly important because I've listened to a few where they're really slow, so I have to speed them up because it's so annoying to listen to and have lots of big pauses in the podcast.*

*It's not actually important to make the aesthetics with the podcast when you're listening to it.*

## 6 Discussion

The study discovered that the podcast information's accuracy is a key factor within the domain of the *Content factor*. The results demonstrated that cancer-affected people are less likely to listen to podcasts that share misleading information and include erroneous and contradictory beliefs. Cancer-affected people generally verify experiential information with their doctors more frequently than the medical information shared by medical practitioners via podcasts. Therefore, the *accuracy* aspect that constitutes one parameter of the intrinsic IQ of the IQ assessment framework (Wang & Strong, 1996) is an essential quality element of cancer-related podcasts. The accuracy of content is notably emphasised when it comes to oppositional listeners, who are more inclined to reject podcasts entirely if the content is less precise or conveys misleading and conflicting information.

Users felt more knowledgeable and confident in sharing information acquired through podcasts with their doctors, particularly when the content was relevant and directly linked to their experience. According to the users, applying the information shared via the podcasts

when making health decisions depends on the *relevance* of the podcast content. Cancer-affected people emphasised the importance of podcasts that provide insightful advice and practical guidance, indicating that the podcast's *usefulness* is another important aspect under the *Content factor*. The podcast listeners also sought comprehensive podcasts incorporating all the current information on the cancer topic under discussion. This focus on comprehensiveness was especially pronounced among negotiated listeners, who displayed an increased concern with podcasts that omitted vital information. The diversity, volume, and depth of the shared information were attributes cancer-affected people perceived as essential for listening to the podcasts. Those attributes align with Zheng et al. (2013) classification of the *richness* dimension.

Having access to current information can help podcast listeners make prompt medical decisions in line with the most recent developments in cancer treatment and care. This is important especially that finding the latest information about cancer can be challenging because cancer information disseminated over the internet may not be regularly updated (Doubleday et al., 2020). Questioning the quality of the podcast content has elicited emotional responses from oppositional listeners, many of whom have voiced strong opinions about discontinuing their engagement with the content because of perceiving a lack of *relevancy, usefulness, completeness, richness, and currency*.

Users who believed that sophisticated medical terminology affected the podcasts' interpretability were more likely to seek podcasts that provide content at an adequate understanding level and utilise simple language. The findings showed that podcasts that included transcripts, examples and scenarios, and a glossary of terms made it easier for listeners to comprehend the shared content. The comprehensiveness of the data is paramount, especially considering that negotiated listeners with medical backgrounds have highlighted the challenges they encounter when dealing with data that is less interpretable or lacks a complete context. While such data may be more easily grasped by negotiated listeners who share a related background or possess extensive experience with cancer, it may be interpreted differently by other listeners. Therefore, *interpretability* within the parameters of the representational IQ of the IQ assessment framework is an essential quality component of cancer-related podcasts.

Podcasts are more credible if they are managed by a well-reputed NPCO and are clear on who was involved in creating the podcast content. Dominant listeners often regard this as a primary factor influencing their trust in and sustained engagement with the podcast content. Users exhibit a greater inclination to listen to podcasts when they are hosted by well-qualified authors who also disclose their affiliations. Therefore, *trustworthiness* and *expertise* underpinning the *Credibility factor* were crucial dimensions of podcasts, indicating that the source credibility model fits well within the podcast quality context.

An important theme that emerged related to users' concern about the level of the speaker's objectivity. Users reported that some podcasts concentrated on the speaker's perspective and made little effort to integrate the experiences of other cancer-affected people. Though users were interested in listening to personalised experiences, the process of inviting comments from others who may wish to endorse or refute the shared content can help address this issue and increase the objectivity of the shared content (Thoma et al., 2015). Negotiated listeners raised doubts about the credibility of certain transmitted messages and leaned towards applying their own validation criteria before accepting any advice. Conversely, oppositional listeners

rejected trust in the information, deeming it biased and subjective due to its emphasis on personal experiences, which they found controversial when compared to knowledge grounded in science and collective experience. Citing sources, referring users to additional good quality resources, and listing any conflicts of interest tend to increase health-related podcasts' credibility (Thoma et al., 2015). Therefore, the objectivity of the speaker was an emerging theme cancer-affected people viewed as important for using podcasts. This finding is consistent with Wang and Strong's (1996) study that identified objectivity as one of the metrics of the intrinsic IQ of the IQ assessment framework and defined it as the extent to which the content was impartial, unprejudiced, and unbiased.

A navigation system featuring clear descriptions of links, logical subject labels, and a powerful search engine is crucial for users when navigating podcast websites. Users are less likely to spend time and effort searching the website to find a particular podcast, and therefore, *navigation* is one of the hygiene factors within the *Design factor's* domain. The process of accessing podcasts using different devices and operating systems was another hygiene factor such that the absence of this functionality would discourage users from listening to cancer-related podcasts. Furthermore, within the *accessibility* feature, users were less inclined to access slow-loading and unresponsive podcasts.

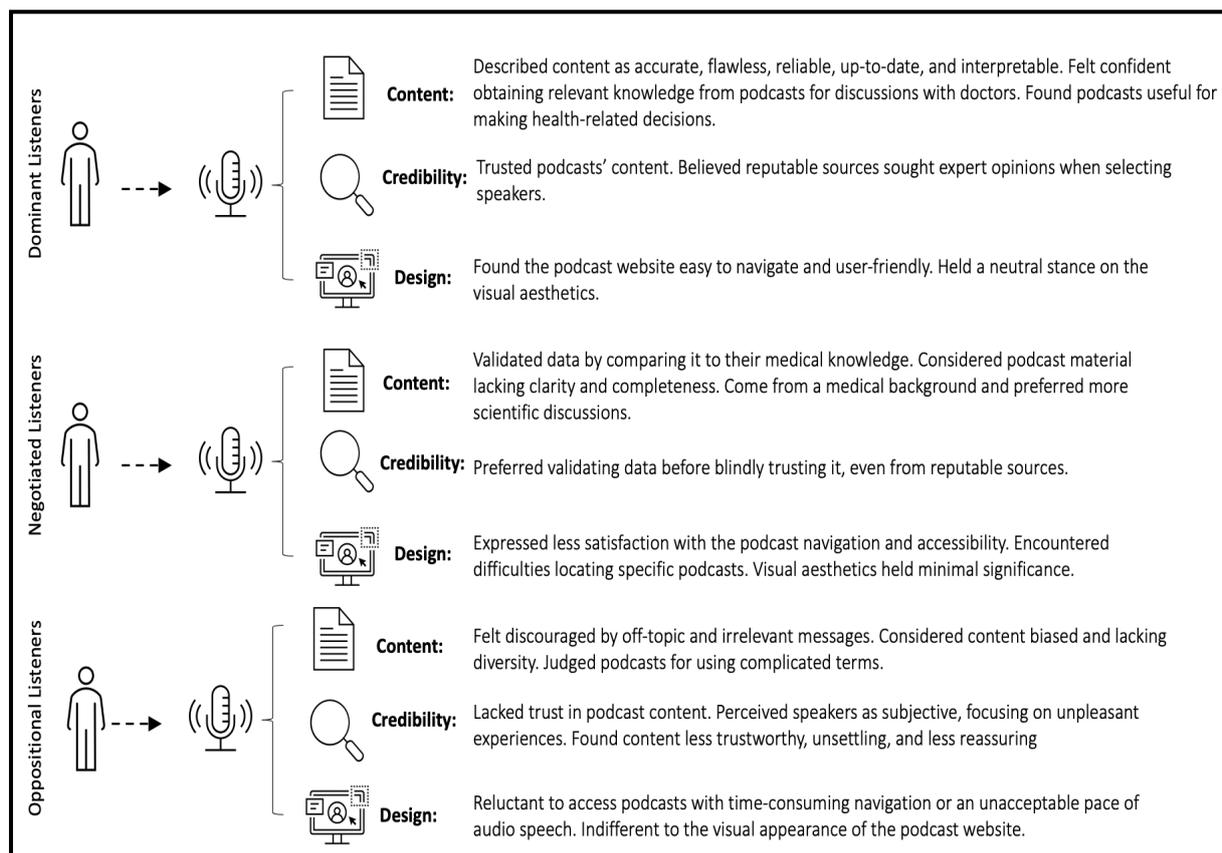


Figure 3. Conceptual Framework on cancer-affected people's perceptions of the dimensions of information quality in cancer-related podcasts

Except for one feature identified by all the three categories of users as a motivating factor within the *aesthetics* dimension that related to the colours, visuals, and themes used for the podcast series website, all other features were hygiene factors. Those features included the pace and speed of the podcast speech and the clarity of the voice recording. In conclusion,

using the two-factor theory of website design (Zhang & Von Dran, 2000) to establish quality indicators of podcast design helped researchers better understand how podcast listeners feel about using cancer-related podcasts for support and evaluating the design of those podcasts. Figure 3 above illustrates the integration of findings from the two different perspectives.

## **7 Conclusion**

This study delved into various facets of the quality of cancer-related podcasts and their influence on how users perceive and engage with them. The research findings showed that accuracy and comprehensiveness in podcast content, particularly for users navigating the challenging landscape of cancer-related information, are of utmost importance. Cancer-affected individuals prioritise podcasts that offer up-to-date guidance, practical advice, and rich contextual information.

Furthermore, the study showed that interpretability is crucial, as listeners who encounter difficulties with complex medical terminology value podcasts that provide content in understandable language and support it with transcripts, examples, scenarios, and glossaries. This consideration is vital, as it ensures that a broader audience can benefit from the content, not just those with a medical background or extensive experience in dealing with cancer.

The study revealed that all dimensions of the credibility factor are critical. The source and expertise of podcast content creators significantly influence listeners' trust in the information presented. Objectivity is an emerging aspect of podcast quality, as users expressed concern about the level of speaker objectivity and the need to integrate diverse perspectives. This theme suggests that involving comments from others who may endorse or challenge the content can enhance objectivity and increase the credibility of shared information.

Within the realm of design, clear navigation systems, speedy loading times, responsive design, and cross-device compatibility are essential for user-friendly podcast experiences. Hygiene factors such as efficient website navigation and accessibility across various devices and operating systems play a pivotal role in user engagement. Additionally, factors related to aesthetics, like colours, visuals, and themes, although important, are more motivating factors rather than hygiene factors in the overall podcast design.

This study provided valuable insights into how podcast quality influences user perceptions and engagement. The integration of these diverse dimensions and perspectives illustrates the multifaceted nature of podcast quality and its impact on users seeking support and information related to cancer. This study contributes to a deeper understanding of podcast quality and offers practical guidance for creators and providers in optimising the design and content of cancer-related podcasts.

Nonetheless, this study is not without limitations. First, this study was based in Australia and used data from only one NPCO that provides cancer-related podcasts. Further studies could recruit respondents experiencing cancer-related podcasts offered by other organisations in different countries to verify the quality factors found in this study. Second, this study assumes that the demands of everyone affected by cancer are similar; thus, it does not differentiate between the views of each patient, survivor, and caregiver when evaluating the quality elements. Therefore, future studies need to investigate differences in perspectives when examining quality indicators of podcasts. Lastly, even though understanding quality indicators of podcasts can help NPCOs effectively design and manage cancer-related podcasts,

the psychosocial outcomes, and the impact of using cancer-related podcasts on users' well-being are still under-researched. Therefore, further research into the impact of cancer-related podcasts on the well-being of cancer-affected people is also needed.

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