Advances in Consumer Research
https://acr-journal.com/
Volume-3 | Issue-3 | March 2026
Original Researcher Article

Self-Tracking Devices and Doctor-Patient relationship: A Qualitative Investigation

Dr Raunak Mishra [1], Dr Anjan Kumar Swain [2]
[1]University of Greenwich, London United Kingdon
[2]Indian Institute of Technology Mandi, India.

ABSTRACT
Over the last decade, self-tracking technologies such as wristbands, phone apps, and medical monitors transitioned from being experimental devices to becoming our everyday companions. They count our steps, track our sleep, and even send us signals when our heart skips a beat ahead of time. These technologies have reset the way people know their bodies, from the periodic medical checkup to the continuous and intimate streams of information. But as surveillance widens, its spill-over effects extend far beyond individual empowerment. They are reshaping one of medicine's most ancient and intimate relationships: doctor-patient.
Self-tracking has introduced new sources of stress. Patients will worry when their monitors flag up anomalies that physicians deem irrelevant. Physicians may be overwhelmed with an influx of numbers that are not necessarily clinically helpful each time. The authority of professional judgment is challenged in the process, especially when new devices conflict with professional recommendation. Patients are anxious that something is not being addressed, and physicians are afraid professionalism is defeating confidence through technology inappropriate to diagnostic precision. In this qualitative study, we aimed to explore a newly developed doctor-patient conversation by interviewing doctors. It is less hierarchical, more symmetrical, but more precarious. The technology is no replacement for human connection, but it enables it, both bridge and barrier. To make self-tracking workable in medicine, we must introduce it not only as a means for data gathering but as an action that reimagines communication, trust, and responsibility.
Finally, self-tracking gives us something besides information. It's a reconfiguring of how we exist in relation to our bodies and how we report our health to others. In this study we're able to integrate these devices more thoughtfully, aware of their limitations but also willing to embrace their potential, they could not only improve medical care but enlarge the human relationship at medicine's core...
Keywords: Doctor-patient Relationship, Self-tracking Devices, Digital health, Health Communication.

INTRODUCTION:

The doctor-patient interaction affects health outcomes, including patient satisfaction and treatment adherence (Kaba et al., 2007; Ward et al., 2018). Self-reported measurements and clinician observations have traditionally been used to understand this connection, but both methods may fail to capture the nuances of real-time interactions (Reynolds & Sawatsky, 2017). Patients' experiences and actions outside of the clinic may now be better-understood thanks to self-tracking technology such as ubiquitous sensors and smartphone apps (Lupton, 2014; Swan, 2013). There has been a rise in the use of self-tracking devices in healthcare, enabling people to keep track of their health and wellness data (Sardi et al., 2017). These devices provide a once-in-a-generation real-time chance to monitor patients' vitals, activities, and habits (Walker et al., 2002; Swan, 2013). They can increase patient involvement and self-efficacy by giving people specific, practical feedback (Lupton, 2014). In addition, self-tracking technologies improve two-way communication between patients and healthcare practitioners, paving the way for patient-centred treatment in joint decision-making. Despite their growing popularity, more research is needed to look at how self-tracking devices can change the doctor-patient dynamic (Lupton, 2014; Sardi et al., 2017). In contrast to their accuracy and usability, not much is known about how these tools will alter the nature of communication between patients and healthcare providers (Lupton, 2014; Patel et al., 2015). Therefore, qualitative studies are necessary to fully grasp the potential of self-tracking devices and increase our understanding of the patient-doctor bond. This research aims to address this gap in the literature by using a qualitative approach and exploring how patients might benefit from self-tracking devices. We first want to look at how people engage with healthcare professionals while wearing self-tracking equipment. An awareness of patient experiences is necessary to comprehend the complexities of the doctor-patient interaction (Oates et al., 2000; Reynolds & Sawatzky, 2017). We can learn more about how self-tracking gadgets affect patients' impressions of healthcare encounters by looking through doctor's testimonies. The second goal is to examine how self-tracking data collected by these devices may impact patient involvement and communication during medical consultations. Patients may monitor many elements of their health using self-tracking gadgets, which provide

real-time information about their behaviours and health (Walker et al., 2002; Swan, 2013). We can determine the advantages and disadvantages of employing these devices by examining the impact of self-tracking data on patient-provider interaction and communication. Researchers have already studied the integration of how self-tracking devices are incorporated in the healthcare sector (Lupton, 2014). We want to discover how self-tracking devices affect patients' self-efficacy and decision-making understanding and how they will support patient empowerment and autonomy. This study will focus on integrating self-tracking devices into the doctor-patient relationship, including privacy and ethical issues for patients. We intend to contribute by creating standards and best practices for utilizing self-tracking devices in healthcare settings by examining possible difficulties and ethical issues.

Also this study aims to address this research gap and broaden the contribution of behavioral science in healthcare by examining the significance of self-tracking devices in understanding the doctor-patient interaction; with that we posit our research objective:

RO: How the self-tracking devices impacted the doctor-patient relationship?

The structure of the article is as follows:

After the introduction, a literature study of the doctor-patient relationship, self-tracking technology, and its use in healthcare will be done. The literature review will highlight the research gap in understanding the function of self-tracking devices in the doctor-patient interaction and provide a thorough picture of the existing state of art. The relevant literature review will describe the methods used for this qualitative inquiry. We will go through the selection procedure, sample makeup, and data collection methods utilized to get detailed and nuanced information from self-tracking device users. The results and analysis of the data will be presented in the methodology section after, structured following the key themes that arose from the interviews. We will examine the impact of self-tracking data on patient engagement, communication patterns, and decision-making processes. The analysis will be supported by direct participant quotations. The implications of our findings within the context of the doctor-patient relationship will then be discussed. We will investigate the potential benefits and challenges of self-tracking devices, including the enhancement of patient empowerment and autonomy, improved patient-provider communication, and the ethical considerations that arise with the integration of self-tracking devices into healthcare settings. In addition, we will discuss the managerial implication followed by discussion and future research direction.

Background Literature

The dynamic interaction between a healthcare provider and a patient constitutes the doctor-patient relationship, a fundamental aspect of healthcare delivery (Haluza et al., 2017; Kaba et al., 2007). This relationship significantly impacts healthcare outcomes, patient satisfaction, and treatment plan adherence. In order to provide optimal patient care, the foundation of the doctor-patient relationship is mutual trust, effective communication, and shared decision-making (Schneider et al., 1992). Trust is the foundation of the doctor-patient relationship it comprising both the patient's faith in the healthcare provider's skill and the provider's faith in the patient's candor and cooperation (Honavar, 2018). Trust facilitates open and truthful communication, permits patients to express their concerns, and encourages active healthcare participation. Patients who trust their healthcare providers are more likely to adhere to treatment recommendations, disclose sensitive information, and communicate their preferences and values during medical decision-making processes (Johnson, 2019). The character of the doctor-patient relationship is also significantly influenced by communication. Effective communication between the healthcare provider and the patient involves exchanging information, ideas, and emotions. It makes it possible to investigate the needs and worries of the patient and makes it easier to make decisions in collaboration with other people. Clear and empathetic communication increases patient satisfaction, promotes adherence to treatment plans, and decreases the risk of medical errors (Gopichandran et al., 2021). Shared decision-making is an evolving aspect of the doctor-patient relationship that emphasizes the active participation of patients in their healthcare decisions. It acknowledges patients as partners in their care, respects their values and preferences, and incorporates their unique perspectives into the decision-making process.

Patients may gather and evaluate their health information using these gadgets, including wearable activity trackers, mobile health apps, and other surveillance tools (Lupton, 2014). By encouraging individuals to actively participate in their healthcare via self-monitoring and exchanging health data with healthcare practitioners, self-tracking technologies can potentially transform the doctor-patient relationship. Self-tracking technology is being used, but there are worries about how it may affect patient-doctor trust, communication, and joint decision-making. The results will help us comprehend the evolving dynamics of the doctor-patient interaction in the digital age. They will facilitate the adoption of self-tracking devices, which will inform healthcare procedures. Self-tracking tools have completely changed how people handle their health and well-being. Individuals may gather and monitor health and daily activity information using self-tracking technology, such as wearable fitness sensors and mobile health apps (Lupton, 2014). These gadgets track health-related information, including calorie intake, pulse rate, sleep habits, and physical activity. Self-tracking has gained popularity as a health management technique in recent years. People are increasingly driven to actively manage their health and create educated opinions about their well-being (Danna et al., 1999). A practical and approachable tool for managing one's health, self-tracking gadgets enable users to keep track of their progress, set goals, and modify their lifestyles (Lupton, 2014). The widespread use of monitoring devices that track their whereabouts has been influenced by various variables. First, as technology has advanced, smaller, more precise, and more user-friendly technologies have been produced that effortlessly fit into people's everyday lives (Patel et al., 2015). The availability of mobile applications and peripheral devices with user-friendly interfaces and real-

time feedback has made self-tracking more accessible and alluring to various individuals. Moreover, the emphasis on preventive healthcare and promoting a healthy lifestyle have contributed to the popularity of self-tracking devices. Individuals pursue instruments that provide actionable insights and feedback as they become more proactive in managing their health (Muñoz et al., 2019). Self-tracking devices allow for assessing progress, recognizing patterns, and making well-informed decisions to enhance health-related behaviors. In addition, the proliferation of social media and online communities has contributed to the rise in popularity of self-tracking devices. Individuals share their self-tracking experiences, progress, and accomplishments on social platforms, fostering a sense of community and support (Lupton, 2017). This social aspect of self-tracking increases motivation and engagement because individuals can connect with others with similar interests, receive feedback, and compete in amicable competitions or challenges. Understanding self-tracking gadgets' origin and usage is necessary to investigate their possible effects on healthcare practices and the doctor-patient relationship. Self-tracking gadgets have become effective healthcare tools with many potential benefits for patients and healthcare institutions. These tools support behavior change and the treatment of chronic diseases in addition to raising patient participation, empowerment, and self-awareness (Chiauzzi et al., 2015). However, they also bring challenges related to data accuracy, privacy issues, and information overload. One of the main benefits of self-tracking technology is its capacity to raise patient involvement in their treatment. These devices allow patients to actively participate in their health management by giving them real-time information on their health habits and progress. A feeling of ownership and control over one's health is fostered by this active engagement, which increases motivation and adherence to advised therapies. Patients can better comprehend their actions and make choices to improve their health outcomes. Self-tracking technology is crucial for promoting behavioral change. The ability to modify one's behavior consciously, such as by increasing physical activity, improving sleep hygiene, or adopting better eating habits, is given to people by their enhanced self-awareness (Feng et al., 2021).

These gadgets' monitoring and tracking capabilities may be helpful for patients with long-term diseases like diabetes or cardiovascular disease. Patients and healthcare professionals may get essential insights into illness management by routinely monitoring vital signs, medication adherence, and lifestyle variables (Lupton, 2014). Self-tracking gadgets allow for spotting irregularities early and promoting timely actions, lowering the risk of problems and hospital stays. Despite these benefits, many challenges must be resolved before self-tracking devices may be used in healthcare. These gadgets' data collection accuracy and reliability raise serious questions. The validity and reliability of the data gathered may be impacted by changes in device accuracy, measurement mistakes, and calibration issues (Appelboom et al., 2014 and Ben-Pazi et al., 2014).

Before making clinical decisions based on the data collected by self-tracking devices, users and healthcare providers must thoroughly evaluate the devices' reliability. Privacy and security also pose significant challenges for devices that track themselves. Continuous collection of personal health data raises concerns regarding data privacy, sharing, and potential security vulnerabilities (Lupton, 2014). Protecting sensitive health information and ensuring secure data transmission and storage are crucial for maintaining patient privacy and trust in the usage of self-tracking devices. Moreover, self-tracking devices can result in information inundation for users, particularly those unfamiliar with interpreting health data (Appelboom et al., 2014 and Ben-Pazi et al., 2014). Research on the doctor-patient relationship has shown that these technologies can enhance communication between patients and healthcare professionals, promote collaborative decision-making, increase patient engagement, and impact patient satisfaction and confidence (Wicks et al., 2010 and Prey et al., 2014). The vast volume of data produced by these gadgets can confuse users, adding complexity to the task of extracting important insights and making well-informed decisions. To fully understand the information gathered by self-tracking devices, users require powerful tools for visualizing and interpreting data, as well as user-friendly interfaces. To maximize the benefits and ensure the responsible use of self-tracking devices in healthcare, data interpretation, accuracy, privacy, and security challenges must be resolved. Self-tracking devices allow patients to participate in their healthcare and actively foster patient engagement. These devices permit individuals to monitor various health parameters and trace their progress over time, increasing self-awareness and motivation for behavior modification (Ancker et al., 2015). Engaged patients are likelier to adhere to their treatment plans, communicate actively with their healthcare providers, and accept responsibility for their health outcomes (Cooper et al., 2003).

In addition, the availability of self-tracking data can substantially affect patient-provider communication and shared decision-making (Truglio et al., 2018). Patients can share self-tracking data with their healthcare providers, which can be a premise for discussions, facilitate more informed decision-making, and enable personalized treatment plans (Piras et al., 2017). This information exchange fosters a collaborative relationship between patients and providers in which patients actively participate in their care (Faiman et al., 2019). Self-tracking devices have the potential to affect patient satisfaction and healthcare provider credibility. Also researchers had found that patients who use self-tracking devices and discuss their data with providers are more satisfied with their care. The availability of objective data enables a more exhaustive comprehension of the patient's health, which could increase confidence in the provider's knowledge and recommendations. Additionally, using self-tracking devices may cultivate a sense of collaboration and shared responsibility between patients and providers, thereby improving the overall doctor-patient relationship (Liu et al., 2022). Interpreting and integrating self-tracking data into clinical practice is a significant challenge. Healthcare providers must develop the skills necessary to analyze and utilize the enormous data generated by these devices. Moreover, concerns

regarding data accuracy, privacy, and security continue to exist. Maintaining patient trust and confidentiality requires ensuring the accuracy of self-tracked data and resolving privacy and security concerns Also, information overload can be an issue with self-tracking devices. The volume of data generated by these devices can be overwhelming for patients and healthcare professionals, which makes it challenging to draw meaningful conclusions (Klausen et al., 2017). According to Howarth et al., (2018), healthcare systems and providers must develop strategies to effectively manage and implement meaningful and actionable patient data. In addition, previous research has frequently ignored the subjective experiences and perceptions of patients and healthcare providers in favor of quantitative methods and objective data analysis.

According to Matthews (2021), qualitative research is necessary to provide a more nuanced comprehension of the function of self-tracking devices in the doctor-patient relationship. Qualitative methods can capture detailed narratives and insights into the lived experiences of individuals using self-tracking devices, enabling a more in-depth examination of their benefits, challenges, and complexities (DiCicco et al., 2006).

Methodology

This qualitative research examines the role of self-tracking tools in comprehending the doctor-patient interaction, (Creswell, 2013) investigating complicated phenomena and thoroughly comprehending people's subjective experiences and social interactions are strengths of qualitative research. Incorporating self-tracking gadgets into patient contacts is a topic of this qualitative study's focus on doctors' attitudes, experiences, and views. The rich, context-specific data that may be gathered via qualitative research can provide insights into the nuanced dynamics of the doctor-patient relationship (Morse, 2015). It enables academics to examine the many facets of communication, trust, and group decision-making in the healthcare industry. In order to examine the subtleties and complexity of the doctor-patient interaction and the effect of self-tracking gadgets on this dynamic, this research uses a qualitative technique. Semi-structured interviews were used as the primary data-gathering method in this research. With a continual emphasis on the research topics, semi-structured interviews enable the exploration of participant viewpoints (Brinkmann & Kvale, 2015). Participants may provide in-depth, individualized descriptions of their experiences, attitudes, and actions about the doctor-patient relationship and the use of self-tracking devices when open-ended questions are used in semi-structured interviews. In order to capture different viewpoints and experiences in diverse healthcare settings, interviews with general practitioners were done. To guarantee reliable data collection, the interviews were audio recorded. The recordings were then transcribed verbatim for analysis. Thematic analysis was then used to examine the interview data (Braun & Clarke, 2006). NVivo, a software for qualitative data analysis, was used to organize, classify, and investigate patterns and themes in the data. This study seeks to thoroughly comprehend the doctor-patient relationship and the implications of self-tracking devices in this context by employing a qualitative research design and semi-structured interviews. The qualitative method permits the exploration of physicians' subjective experiences, perceptions, and interactions, casting light on the complexities of this relationship and the potential impact of self-tracking devices on patient care.

Data Collection:

The selection criteria for participants in this research included physicians from various specialties and healthcare settings. The following were the inclusion criteria for participants:

- Actively participating (on-duty Doctors) in patient care
- Possessing at least two years of clinical experience
- Being willing to share their perspectives on the doctor-patient relationship and the use of self-tracking devices

The purpose of including a variety of physicians was to encompass a wide range of experiences and perspectives in the study. The recruitment procedure involved contacting potential participants via multiple channels, including professional networks, medical associations, and healthcare institutions. It endeavored to include physicians from various specialties and healthcare contexts, including primary care clinics, hospitals, and specialty clinics. A purposeful sampling strategy was utilized to select participants who could provide insightful information regarding the doctor-patient relationship and their experiences with self-tracking devices. A total of 28 physicians representing various specialties, including internal medicine, pediatrics, cardiology, and family medicine, participated in the study. The participants' ages ranged from 30 to 55, and they represented a variety of genders and years of clinical experience, mentioned in Table 1.

Interviews with a semi-structured format served as the primary method of data collection. The interviews were structured to allow for a flexible and interactive conversation with the participants while ensuring that essential themes and queries regarding the doctor-patient relationship and self-tracking devices were addressed. The development of an interview guide consisting of open-ended queries and prompts to investigate participants' perspectives, experiences, and attitudes. The interview guide covered topics including the character of the doctor-patient relationship, communication dynamics, obstacles faced, and the incorporation of self-tracking devices into patient care. During the interviews, the participants' responses were audio-recorded to ensure the veracity of data analysis and capture their detailed narratives. Participants could openly convey their opinions and experiences because the interviews were conducted privately and comfortably. The audio recordings were transcribed word-for-word, capturing all verbal expressions and nuances for further analysis.

Participant Number (PN)	Age	Gender
PN1	32	Male
PN2	39	Male

PN3	37	Female
PN4	42	Female
PN5	53	Male
PN6	46	Male
PN7	42	Female
PN8	43	Female
PN9	52	Male
PN10	43	Male
PN11	44	Male
PN12	40	Female
PN13	44	Male
PN14	36	Male
PN15	34	Female
PN16	48	Male
PN17	55	Male
PN18	54	Male
PN19	47	Male
PN20	40	Female
PN21	49	Male
PN22	37	Male
PN23	40	Female
PN24	45	Female
PN25	48	Male
PN26	34	Male
PN27	43	Male
PN28	33	Male

Table 1: Representation of participants

Data Analysis:

Interview data were analysed using thematic analysis in this study. Thematic analysis is a flexible and systematic technique for identifying, analysing, and interpreting themes or patterns within qualitative data (Braun & Clarke, 2006). The analysis process consisted of multiple stages, content analysis, to unearth significant insights and develop a thorough comprehension of the data. NVivo, a widely-used software for qualitative data analysis, facilitated the analysis. NVivo enables the effective organization, administration, and classification of qualitative data, thereby facilitating the systematic investigation of themes and patterns (QSR International, 2021). The interview transcripts were meticulously read and reread to generate initial codes during the open coding analysis. Codes are identifiers or the names assigned to data segments to convey their substance. Through the iterative coding process, participants' responses were compared and contrasted, and preliminary themes emerged. This process required constant data comparison and code refinement to ensure comprehensive data coverage (Charmaz, 2006). Subsequently, text analysis was conducted to investigate code relationships and generate higher-level themes. Based on their conceptual connections, codes were classified into broader categories, and the relationships between categories were examined. This method assisted in the identification of overarching themes that conveyed the essence of the participants' experiences and perspectives regarding the doctor-patient relationship and the use of self-tracking devices. (Guest, Bunce, & Johnson, 2006) The analysis procedure was rigorous and systematic, ensuring data saturation and consistency in interpretation. Two researchers contributed to the analysis to improve the reliability and validity of the results. The research team held regular meetings and discussions to examine the coding, resolve discrepancies, and refine the emergent themes.

Preliminary analysis based on word cloud and word frequency

Using the qualitative data analysis software NVivo, a preliminary analysis of the interview data was performed. Initial insights into the dataset were gained using word cloud and word frequency analyses. The word cloud generated a visual representation of the most frequently used terms in the interviews, providing a comprehensive overview of the topics and themes discussed by the participants. Figure 1 shows a word cloud analysis diagram developed for this research; however, the words chosen for this diagram are minor. Thanks to the word cloud analysis visualization, it is easy to see which terms appear most often. The figure's font size reflects the frequency with which each term appears. John et al. (2018) found that higher occurrence rates were associated with higher levels of focus.

"self-tracking devices" (823 occurrences, accounting for 2.05%); "innovation & innovative" (293 occurrences, accounting for 1.14%); "healthcare provider" (232 occurrences, accounting for 1.87%); "patient" (308 occurrences, accounting for 1.10%); "health condition" (304 occurrences, accounting for 1.05%); and "privacy" (94 occurrences, accounting for 0.63%). Word frequency analysis also helped spot common themes by showing how often certain words and phrases were used. This first analysis laid the groundwork for the following in-depth thematic analysis by directing the coding process and highlighting important topics for future investigation.

Doctor- Patient Relationship	284	1
Mixed	23	1
Negative	42	1
Neutral	115	1
Positive	104	1

Figure 1 Generated word cloud analysis diagram.

Analysis of the participant's responses.

The results of a sentiment analysis performed on participant replies in a study paper are covered in this section. The general sentiment of the participants was examined using the qualitative data analysis tool NVivo. The research showed that most participants' feelings were reasonably favorable. This paper thoroughly explains the sentiment analysis findings and how they relate to the subject of the study. A visual depiction of the sentiment distribution within the dataset can be seen in the sentiment analysis graphic. The figure 2 emphasis on moderately happy feelings supports the conclusion that participants generally had an optimistic outlook. The overall results of the sentiment analysis are supported by this graphic depiction, which makes it fast and easy to grasp the participants' sentiments. Responses from participants were analyzed for emotion, and it was found that somewhat happy feelings predominated. Participants showed a degree of passion and optimism regarding the subject of the inquiry by expressing a generally favorable opinion toward it. The frequency and strength of positive feelings throughout the replies demonstrated moderately pleasant thoughts in table 2.

Respondent sentiment analysis for interview questions

- Can you describe your experience with patients who use self-tracking devices to manage their health
- How do self-tracking devices impact the doctor-patient relationship
- How do you ensure that patient data collected from self-tracking devices is secure and protected
- How do you collaborate with other healthcare providers to manage patient care using self-tracking devices
- Have you noticed any changes in patient behavior or attitudes towards their health as a result of using self-tracking devices
- How do you see the use of self-tracking devices evolving in the future of healthcare
- In your experience, what advice would you give to healthcare providers who are considering integrating self-tracking devices into their practice
- How do self-tracking devices impact your ability to monitor and treat patients
- What challenges have you encountered when reviewing data from self-tracking devices
- How do you handle patient data collected from self-tracking devices, and what steps do you take to ensure its accuracy
- In your opinion, how do self-tracking devices impact patient engagement in their own health
- What types of self-tracking devices have you seen patients use, and which ones do you find most effective
- How do you determine which self-tracking device is best suited for a patients needs
- Have you noticed any trends or patterns in patient data collected from self-tracking devices that have led to improved health outcomes
- Have you encountered any challenges in getting patients to use self-tracking devices, and if so, how have you addressed them

Figure 2 Result for the Respondent sentiment analysis for interview questions

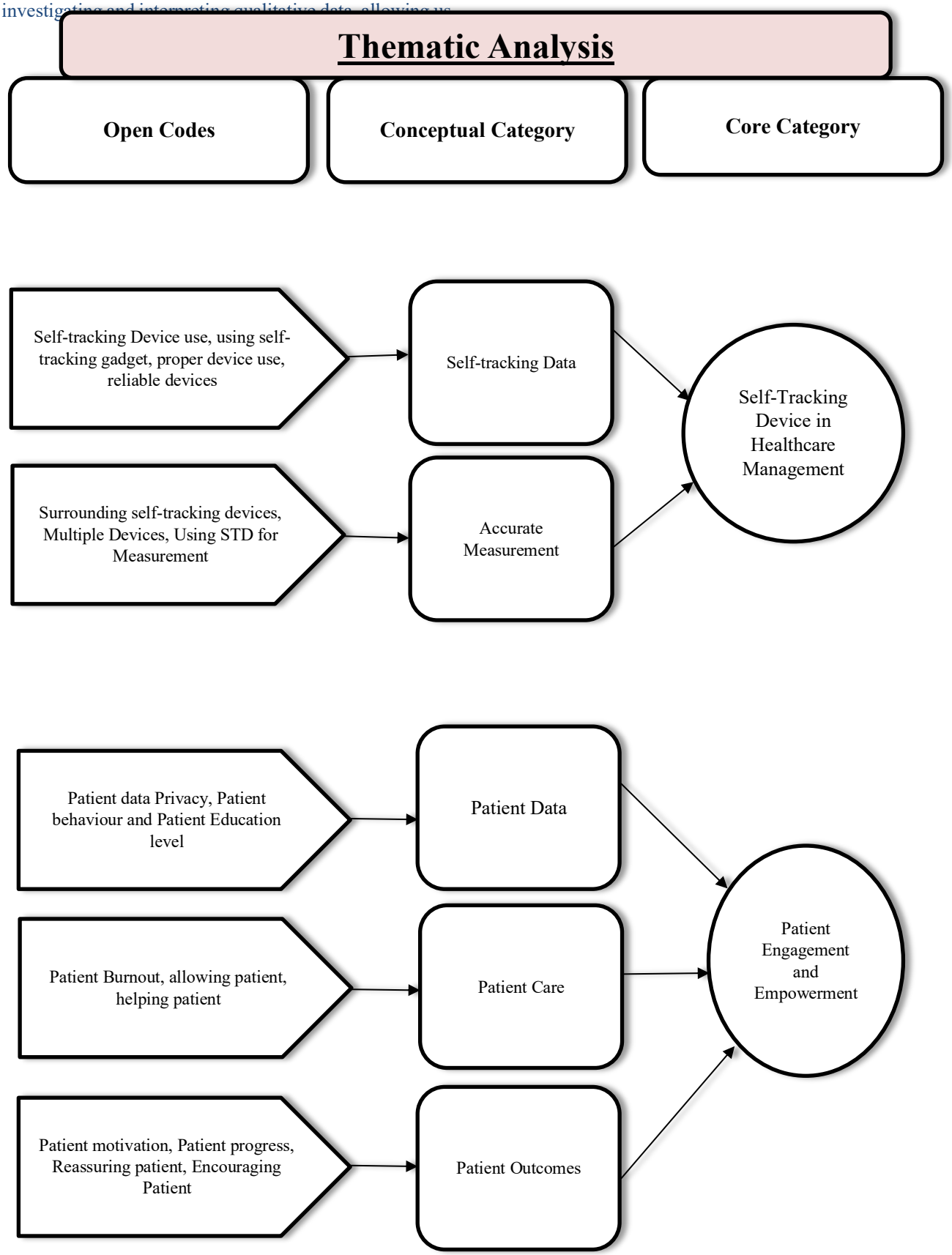
Implementation of thematic analysis process

We followed the method outlined by Braun and Clarke (2006) and Nowell et al. (2017) when conducting the thematic analysis for our qualitative study on self-tracking devices' function in understanding the doctor-patient relationship. The first stage consisted of familiarizing oneself with the data, which included perusing and rereading the interview transcripts to thoroughly comprehend the content and context. We then generated initial codes by systematically identifying and labelling or tagging significant data elements. This process of line-by-line classification enabled us to identify significant concepts, ideas, and patterns that emerged from the interviews. Then, we searched for themes within the data by reviewing and comparing codes, clustering related codes, and identifying themes that represented significant aspects of the doctor-patient relationship and the function of self-tracking devices. We reviewed and refined the themes throughout this process, organizing related codes under each theme to ensure coherence and clarity. The themes were given succinct and profound names along with precise definitions. To increase the rigor and validity of our analysis, we reviewed and validated the identified themes by soliciting the opinions of other researchers and

Table 2 Represents the codes generated.

	Number of coding references	Number of items coded

undertaking participant verification. In order to enhance the richness and profundity of the analysis, we incorporated illustrative quotations or excerpts from the interviews into the final narrative. The thematic analysis provided a systematic and rigorous approach to investigating and interpreting qualitative data, allowing us to thoroughly comprehend the doctor-patient relationship and the function of self-tracking devices (Braun & Clarke, 2006; Nowell et al., 2017). In figure 3, we have provided the five core themes generated after the thematic analysis for the interview results.



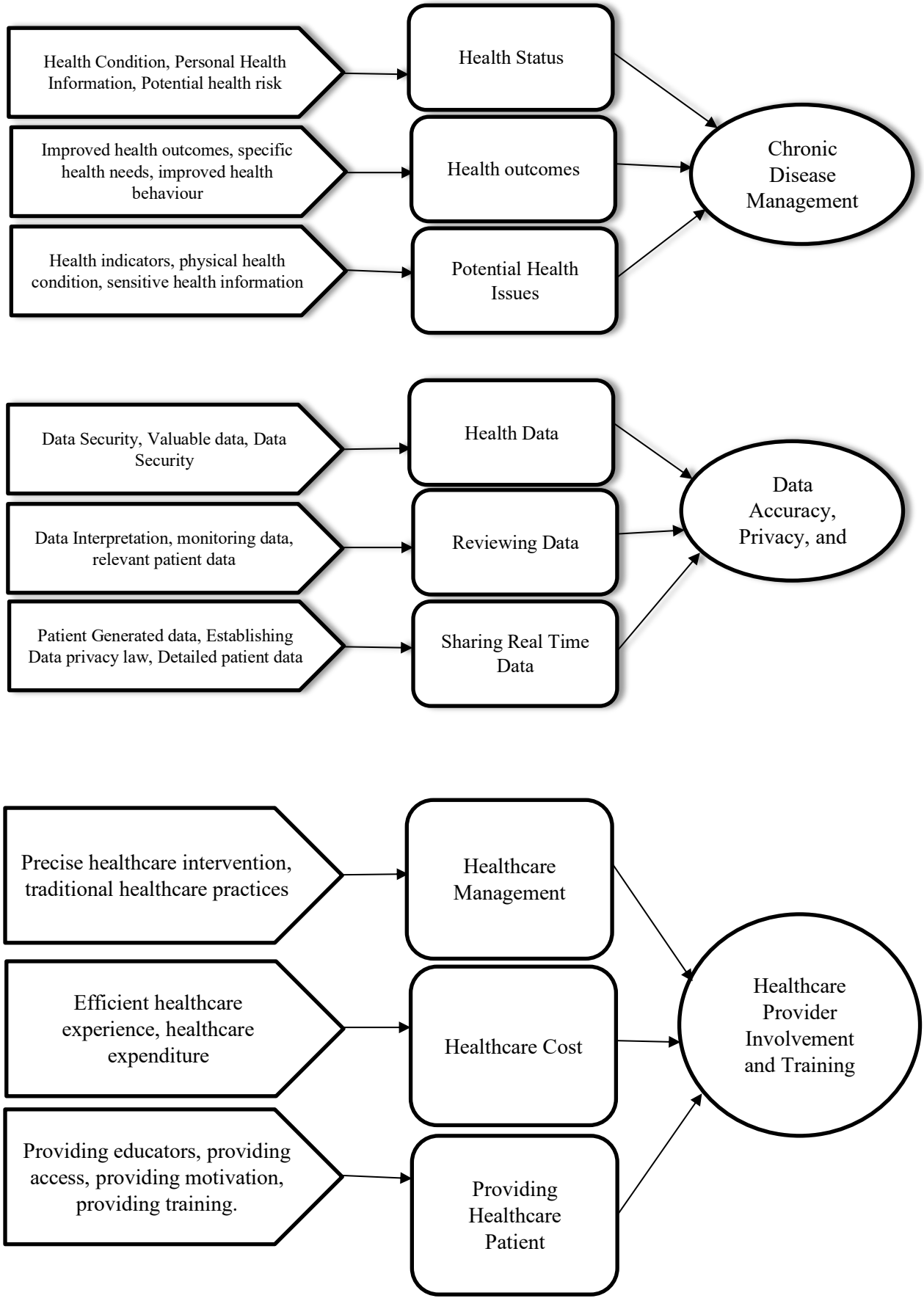


Figure 3 Represents the core categories formation by thematic analysis

Self-tracking devices in healthcare management

The interview data were subjected to a thematic analysis, revealing five key themes regarding using self-tracking devices in healthcare administration and their impact on the doctor-patient relationship. The participants' emphasis on how self-tracking devices, such as wearable fitness trackers and mobile health apps, enable individuals to monitor and manage their health behaviours and conditions actively was a significant theme that emerged from the research on the use of self-tracking devices in healthcare management (Lupton, 2016). By monitoring parameters such as physical activity, sleep patterns, and vital signs, patients obtain a sense of control and ownership over their health, resulting in increased motivation and empowerment in managing their health (Patel et al., 2015).

Respondent: *"I foresee the use of self-tracking devices evolving in the future of healthcare administration as more patients become aware of the benefits of using these devices and technology continues to advance. I believe these devices will become more incorporated into treatment strategies and play a greater role in enhancing patient outcomes."*

Patient engagement and empowerment

One of the main themes that emerged from the analysis of the interview data was the idea of patient empowerment and participation. Participants highlighted the significance of self-tracking devices in empowering patients to play an active role in their healthcare journey. By providing access to real-time health data, self-tracking devices enable patients to monitor their health status, assess their progress, and make informed decisions regarding their well-being (Ferguson et al., 2015). Individuals became increasingly invested in their healthcare outcomes, resulting in increased patient engagement. Participants reported that self-tracking devices promoted a sense of ownership and responsibility, thereby encouraging patients to actively engage in self-management strategies and adopt healthier behaviors (Lupton, 2016). The ability to view and monitor their health data in real time provided patients with a sense of control and agency, empowering them to take an active role in their healthcare. This theme emphasizes the transformative potential of self-tracking devices to empower patients and promote their active involvement in healthcare management.

Respondent*: "The potential for increased patient engagement and empowerment is one of the most significant advantages of using self-tracking devices in healthcare." Patients become more invested in their health outcomes and aware of how their lifestyle choices influence their health when they have access to their health data."*

Chronic disease management

Another significant theme that emerged was the role of self-tracking devices in facilitating behavior change among chronic disease patients. The participants discussed how continuous surveillance and monitoring of health-related behaviors, such as physical activity, medication adherence, and dietary practices, can promote behavior modification and healthier lifestyles (Sarcona et al., 2017). The information gathered by self-tracking devices provides patients with insights into their behaviors, patterns, and progress, allowing them to identify areas for improvement and set attainable goals. Participants observed that self-tracking devices could serve as reminders, motivators, and accountability tools, thereby aiding individuals in establishing and maintaining positive behaviors to manage chronic diseases (Schroeder et al., 2018).

Respondent*: "The potential for increased patient engagement and empowerment is one of the most significant advantages of using self-tracking devices in healthcare." Patients become more invested in their health outcomes and aware of how their lifestyle choices influence their health when they have access to their health data.*

Data accuracy, privacy and Security

In addition, participants expressed significant concern regarding the precision and dependability of data. Although self-tracking devices provided an abundance of health data, participants expressed concerns regarding the accuracy and validity of the collected information (Case et al., 2015 and Wieczorek et al., 2022). They were concerned that inaccurate measurements or discrepancies in data interpretation could lead to incorrect health conclusions or decisions. Participants emphasized the significance of healthcare professionals critically evaluating and interpreting self-tracking data to ensure its validity and reliability. This theme highlights the importance of assuring the accuracy and dependability of self-tracking devices for the preservation of the doctor-patient relationship and the quality of healthcare administration (Sharon, 2017).

Respondent*: "I have encountered unforeseen obstacles, such as data accuracy and interpretation, which require resolution."*

Healthcare provider involvement and training

The role of healthcare providers in fostering patient-provider communication and shared decision-making through self-tracking devices also emerged as an important theme. Participants discussed how self-tracking data could be helpful to for initiating dialogues between patients and providers, facilitating more informed and collaborative decision-making processes (Faiman et al 2019). Participants emphasized the need for healthcare providers to actively engage patients in comprehending their self-tracked data, addressing any concerns or ambiguities, and collaboratively devising personalized care plans based on the gained insights. This theme emphasizes the significance of practical communication skills and patient-centred approaches for maximizing the potential of self-tracking devices to improve doctor-patient relationships and healthcare outcomes (Raleigh et al., 2022).

Respondent*: "Self-tracking devices can be integrated into existing healthcare systems by developing standardized protocols for data collection and analysis, providing*

healthcare providers with training on how to interpret data, and developing secure platforms for data sharing and communication between patients and healthcare providers."

Conclusion and future research direction

The results of this qualitative study provide insightful information on the use of self-tracking technology in the doctor-patient relationship. The research uncovered five significant themes that clarified the possible advantages and difficulties of using self-tracking devices in healthcare. Indicating that self-tracking devices improve patient involvement and enable people to play an active part in controlling their health, the subject of patient empowerment emerged as a significant finding. These gadgets help people make educated choices and work with healthcare professionals in shared decision-making processes by delivering real-time data and insights about their health habits and situations. This result is consistent with other studies showing the beneficial effects of self-tracking on patient involvement and self-management (Patel et al., 2015; Lupton, 2016).

The potential for self-tracking technologies to enhance communication and joint decision-making between physicians and patients also emerged as a critical subject. Participants spoke about how self-tracking data may be used as factual proof when speaking with healthcare professionals, resulting in better-informed dialogues and promoting understanding (White et al., 2013 and Haleem et al., 2021). This result lends credence to the premise that self-tracking technology might help with a data-driven approach to healthcare, enabling tailored treatment regimens and better patient-provider communication. This study has several implications, demonstrating both the promise for empowerment and the difficulties associated with self-tracking devices in healthcare. The research identifies key elements that demonstrate how self-tracking devices may revolutionize the doctor-patient relationship by promoting patient engagement and involvement in their own health management. These gadgets seem to have a democratizing impact by giving patients vital data to contribute to shared decision-making with healthcare practitioners.

However, the research also pointed out specific difficulties with self-tracking technology. The problem of data dependability and correctness is one such difficulty (Sharon, 2017). Participants raised doubts regarding the reliability of self-reported data, highlighting the necessity for healthcare professionals to rectify inconsistencies and guarantee the accuracy of the data gathered. This conclusion emphasizes how crucial it is for medical professionals to be engaged in analyzing and incorporating self-tracked data into clinical decision-making procedures. Participants also expressed worries about data security and privacy, highlighting the need to take proper steps to secure personal health information (Nikolajsen et al., 2015).

Furthermore, these devices are reshaping the dynamics of the healthcare industry, particularly the traditional doctor-patient relationship. The paper aims to dissect these phenomena through a series of focused studies, each addressing a specific dimension of the growing influence of self-tracking devices. It seeks not only to elucidate the underlying psychological, privacy, and social implications but also to offer guidance for stakeholders involved in the design, regulation, and use of these technologies.

.

REFERENCES

1. Ancker, J. S., Witteman, H. O., Hafeez, B., & Provencher, T. (2015). “You get reminded you're a sick person”: Personal data tracking and patients with multiple chronic conditions. Journal of Medical Internet Research, 17(8), e202. doi:10.2196/jmir.4391
2. Appelboom, G., Yang, A. H., Christophe, B. R., Bruce, E. M., Slomian, J., Bruyère, O., ... & Connolly Jr, E. S. (2014). The promise of wearable activity sensors to define patient recovery. Journal of Clinical Neuroscience, 21(7), 1089-1093.
3. Ben-Pazi, H., Browne, P., Chan, P., Cubo, E., Guttman, M., Hassan, A., ... & International Parkinson and Movement Disorder Society Telemedicine Task Force J. Bajwa BR Bloem NB Galifianakis E. Gatto CG Goetz M. Katz A. Pantelyat C. Tanner M. Spindler. (2018). The promise of telemedicine for movement disorders: an interdisciplinary approach. Current neurology and neuroscience reports, 18, 1-10.
4. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77-101.
5. Brinkmann, S., & Kvale, S. (2015). Interviews: Learning the craft of qualitative research interviewing. Sage.
6. Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. Sage.
7. Chiauzzi, E., Rodarte, C., & DasMahapatra, P. (2015). Patient-centered activity monitoring in the self-management of chronic health conditions. BMC medicine, 13(1), 1-6. https://doi.org/10.1186/s12916-015-0319-2
8. Cooper, L. A., & Roter, D. L. (2003). Patient-provider communication: the effect of race and ethnicity on process and outcomes of healthcare. Unequal treatment: Confronting racial and ethnic disparities in health care, 552493.
9. Creswell, J. W., & Poth, C. N. (2016). Qualitative inquiry and research design: Choosing among five approaches. Sage publications.
10. Danna, K., & Griffin, R. W. (1999). Health and well-being in the workplace: A review and synthesis of the literature. Journal of management, 25(3), 357-384 https://doi.org/10.1177/014920639902500305
11. DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. Medical education, 40(4), 314-321.
12. Faiman, B., & Tariman, J. D. (2019). Shared

Decision Making: Improving Patient Outcomes by Understanding the Benefits of and Barriers to Effective Communication. Clinical Journal of Oncology Nursing, 23(5), 540-542. 10.1188/19.CJON.540-542

13. Faiman, B., & Tariman, J. D. (2019). Shared Decision Making: Improving Patient Outcomes by Understanding the Benefits of and Barriers to Effective Communication. Clinical Journal of Oncology Nursing, 23(5), 540-542. 10.1188/19.CJON.540-542

14. Feng, S., Mäntymäki, M., Dhir, A., & Salmela, H. (2021). How self-tracking and the quantified self promote health and well-being: systematic review. Journal of Medical Internet Research, 23(9), e25171.

15. Ferguson, T., Rowlands, A. V., Olds, T., & Maher, C. (2015). The validity of consumer-level, activity monitors in healthy adults worn in free-living conditions: A cross-sectional study. International Journal of Behavioral Nutrition and Physical Activity, 12, 42.

16. Gopichandran, V., & Sakthivel, K. (2021). Doctor-patient communication and trust in doctors during COVID 19 times—A cross sectional study in Chennai, India. Plos one, 16(6), e0253497. https://doi.org/10.1371/journal.pone.0253497

17. Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. Field Methods, 18(1), 59-82.

18. Haleem, A., Javaid, M., Singh, R. P., & Suman, R. (2021). Telemedicine for healthcare: Capabilities, features, barriers, and applications. Sensors international, 2, 100117.

19. Haluza, D., Naszay, M., Stockinger, A., & Jungwirth, D. (2017). Digital natives versus digital immigrants: influence of online health information seeking on the doctor–patient relationship. Health communication, 32(11), 1342-1349. https://doi.org/10.1080/10410236.2016.1220044

20. Honavar, S. G. (2018). Patient–physician relationship–Communication is the key. Indian journal of ophthalmology, 66(11), 1527. 10.4103/ijo.IJO_1760_18

21. Howarth, A., Quesada, J., Silva, J., Judycki, S., & Mills, P. R. (2018). The impact of digital health interventions on health-related outcomes in the workplace: a systematic review. Digital health, 4, 2055207618770861.

22. John, M., Marbach, E., Lohmann, S., Heimerl, F., & Ertl, T. (2018). MultiCloud: Interactive word cloud visualization for the analysis of multiple texts. In Proceedings of the 44th Graphics Interface Conference (pp. 34-41). ACM Digital Library. https://doi.org/10.20380/GI2018.06

23. Johnson, T. (2019). The importance of physician-patient relationships communication and trust in health care. Duke Center for Personalized Healthcare.

24. Kaba, R., & Sooriakumaran, P. (2007). The evolution of the doctor-patient relationship. International journal of surgery, 5(1), 57-65. https://doi.org/10.1016/j.ijsu.2006.01.005

25. Klausen, R. K., Blix, B. H., Karlsson, M., Haugsgjerd, S., & Lorem, G. F. (2017). Shared decision making from the service users' perspective: A narrative study from community mental health centers in northern Norway. Social Work in Mental Health, 15(3), 354-371.

26. Liu, Y., Kornfield, R., Yang, E. F., Burnside, E., Keevil, J., & Shah, D. V. (2022). Patient-provider communication while using a clinical decision support tool: explaining satisfaction with shared decision making for mammography screening. BMC Medical Informatics and Decision Making, 22(1), 323. https://doi.org/10.1186/s12911-022-02058-3

27. Lupton, D. (2014). Quantified sex: A critical analysis of sexual and reproductive self-tracking using apps. Culture, Health & Sexuality, 16(4), 443-459. doi:10.1080/13691058.2014.882476

28. Lupton, D. (2014). Self-tracking modes: Reflexive self-monitoring and data practices. Available at SSRN 2483549. http://dx.doi.org/10.2139/ssrn.2483549

29. Lupton, D. (2015). Quantified sex: a critical analysis of sexual and reproductive self-tracking using apps. Culture, health & sexuality, 17(4), 440-453.

30. Matthews, A. (2021). Blurring boundaries between humans and technology: postdigital, postphenomenology and actor-network theory in qualitative research. Qualitative Research in Sport, Exercise and Health, 13(1), 26-40.

31. Morse, J. M. (2015). Critical analysis of strategies for determining rigor in qualitative inquiry. Qualitative Health Research, 25(9), 1212-1222.

32. Muñoz, A., Fontalba-Navas, A., Arrebola, J. P., & Larrea-Killinger, C. (2019). Trust and distrust in relation to food risks in Spain: An approach to the socio-cultural representations of pregnant and breastfeeding women through the technique of free listing. Appetite, 142, 104365. https://doi.org/10.1016/j.appet.2019.104365

33. Nikolajsen, C., & Dinesen, B. I. (2015). Patient-driven Health Care Models: The Future Patient using Self-tracking Technologies. International Journal of Integrated Care (IJIC), 15.

34. Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. International journal of qualitative methods, 16(1), 1609406917733847.

35. Oates, J., Weston, W. W., & Jordan, J. (2000). The impact of patient-centered care on outcomes. Fam Pract, 49(9), 796-804.

36. Patel, M. S., Asch, D. A., & Volpp, K. G. (2015). Wearable devices as facilitators, not drivers, of health behavior change. JAMA, 313(5), 459-460.

37. Piras, E. M., & Miele, F. (2017). Clinical self-tracking and monitoring technologies: negotiations in the ICT-mediated patient–provider relationship. Health Sociology Review, 26(1), 38-53.

38. Prey, J. E., Woollen, J., Wilcox, L., Sackeim, A. D., Hripcsak, G., Bakken, S., ... & Vawdrey, D. K. (2014). Patient engagement in the inpatient setting: a systematic review. Journal of the American Medical Informatics Association, 21(4), 742-750.

39. QSR International. (2021). NVivo (Version 12) [Computer software]. https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

40. Reynolds, J., & Sawatzky, R. (2017). The patient's experience of the therapeutic relationship

within a qualitative study of participatory action research in critical care. Journal of Clinical Nursing, 26(5-6), 782-792. doi:10.1111/jocn.13451

41. Reynolds, J., & Sawatzky, R. (2017). The patient's experience of the therapeutic relationship within a qualitative study of participatory action research in critical care. Journal of Clinical Nursing, 26(5-6), 782-792. doi:10.1111/jocn.13451

42. Sarcona, A., Kovacs, L., Wright, J., & Williams, C. (2017). Differences in eating behavior, physical activity, and health-related lifestyle choices between users and nonusers of mobile health apps. American Journal of Health Education, 48(5), 298-305.

43. Sardi, L., Idri, A., & Fernández-Alemán, J. L. (2017). A systematic review of gamification in e-Health. Journal of Biomedical Informatics, 71, 31-48. doi:10.1016/j.jbi.2017.05.011

44. Schneider, D. E., & Tucker, R. K. (1992). Measuring Communicative Satisfaction in Doctor--Patient Relations: The Doctor--Patient Communication Inventory. Health Communication, 4(1), 19-28. https://doi.org/10.1207/s15327027hc0401_2

45. Schroeder, J., Chung, C. F., Epstein, D. A., Karkar, R., Parsons, A., Murinova, N., ... & Munson, S. A. (2018, June). Examining self-tracking by people with migraine: goals, needs, and opportunities in a chronic health condition. In Proceedings of the 2018 designing interactive systems conference (pp. 135-148).

46. Swan, M. (2009). Emerging patient-driven health care models: an examination of health social networks, consumer personalized medicine and quantified self-tracking. International journal of environmental research and public health, 6(2), 492-525. https://doi.org/10.3390/ijerph6020492

47. Swan, M. (2013). The quantified self: Fundamental disruption in big data science and biological discovery. Big Data, 1(2), 85-99.

48. Truglio-Londrigan, M., & Slyer, J. T. (2018). Shared decision-making for nursing practice: an integrative review. The open nursing journal, 12, 1.

49. Walker, K. L., Arnold, C. L., Miller-Day, M., & Webb, L. M. (2002). Investigating the physician-patient relationship: Examining emerging themes. Health Communication, 14(1), 45-68. https://doi.org/10.1207/S15327027HC1401_3

50. Walker, K. L., Arnold, C. L., Miller-Day, M., & Webb, L. M. (2002). Investigating the physician-patient relationship: Examining emerging themes. Health Communication, 14(1), 45-68. https://doi.org/10.1207/S15327027HC1401_3

51. Ward, P. (2018). Trust and communication in a doctor-patient relationship: a literature review. Arch Med, 3(3), 36. https://doi.org/10.4172/2472-1654.100146

52. White, A., & Danis, M. (2013). Enhancing patient-centered communication and collaboration by using the electronic health record in the examination room. Jama, 309(22), 2327-2328.

53. Wicks, P., Massagli, M., Frost, J., Brownstein, C., Okun, S., Vaughan, T., ... & Heywood, J. (2010). Sharing health data for better outcomes on PatientsLikeMe. Journal of medical Internet research, 12(2), e1549.

54. Wieczorek, M., O'Brolchain, F., Saghai, Y., & Gordijn, B. (2022). The ethics of self-tracking. A comprehensive review of the literature. Ethics & Behavior, 1-33. https://doi.org/10.1080/10508422.2022.2082969..

.