International Journal of Healthcare Information Systems and Informatics
Volume 19 • Issue 1

Assessing the Alignment Between Existing Finnish Patient Portals and the Newly Implemented Finnish Well-Being Reform:

Informed by Insights From the US Health Reform Monitoring

Marlon Luca Machal, Tampere University, Faculty of Medicine and Health Technology, Korkeakoulunkatu 3, Tampere, Finland*
https://orcid.org/0000-0002-7800-8219

ABSTRACT

Due to the recent implementation of the Finnish well-being reform, there is limited research discussing the reform's aims and its alignment with existing Finnish patient portals. The objective of this research is to assess the alignment between existing Finnish patient portals and the newly implemented well-being reform. This research is supported by the insights gained from monitoring the US health reform survey that was conducted in 2021. By Aligning patient portals with the well-being reform, there is an opportunity to achieve patient-centered care and facilitate improved communication between patients and healthcare providers.

KEYWORDS

Alignment, Balance, Cost, Empowerment, Healthcare, Patient Portals, Well-Being Reform

1. INTRODUCTION

The well-being of 21 counties reform (Sote-uudistus, 2023) in Finland has brought significant changes to the healthcare services, aiming to enhance the quality of care, improve patient outcomes, and increase overall well-being (Keskimäki et al., 2019; Koivisto et al.,2019). This reform focuses on transforming healthcare delivery by integrating various services, promoting preventive care, and empowering patients to actively participate in their healthcare decisions (Koivisto et al.,2018).

Patient portals (Nøst et al., 2021; National Library of Medicine, 2023) have emerged as an integral component of the well-being counties reform. The importance of patient portals within the well-being counties reform cannot be overstated (Keskimäki et al., 2019). They have the potential power to improve patient outcomes, enhance communication between patients and healthcare providers, and facilitate access to healthcare services. Patient portals are digital tools that enable individuals to conveniently access their health information, review test results, and monitor their health progress (Carini et al., 2021; Sipanounet al., 2022; Lear et al., 2022; Khadjesari et al., 2023; Nelson et al.,

DOI: 10.4018/IJHISI.333604 *Corresponding Author

2023). Additionally, these digital tools can promote self-care, facilitate care coordination among different healthcare providers, and contribute to the overall efficiency of the healthcare system (Sieck et al., 2018; Brands et al., 2022, Cresswell et al., 2022; Singh et al.,2023; Zachrison et al., 2023). The Finnish well-being reform was accepted by Finnish parliament in June 2021 (Finnish Ministry of Social Affairs and Health, 2021). The objective of this research is to assess the alignment between the existing Finnish patient portals and the recently implemented Finnish well-being reform, which became effective on January 1, 2023. There is limited research discussing the reform's aims and the growth of the use of Finnish patient portals. To support this assessment, insights from the US Health reform monitoring were utilized.

2. MATERIALS AND METHODS

There is limited research that assessed the alignment between the newly implemented well-being counties reform and the existing Finnish patient portals. To support the claim of limited research, a systematic search was conducted using PubMed databases and Finnish Journal of eHealth and eWelfare. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The purpose of the systematic search was to identify relevant studies that assessed the Finnish patient portals and their alignment with the well-being county reform. The key search words used were: "Finnish patient portals and Finnish well-being counties." Furthermore, Finnish search terms such as "Suomalaiset potilasportaalit and Sosiaali ja terveydenhuollon Hyvinvointialueet" were employed. The covered research period was between January 2018 and September 2023. While differences exist in the healthcare systems of the United States and Finland, patients in both countries benefit from the presence of patient portals within their respective healthcare landscapes. Furthermore, patient portals in both countries share the mutual objective of enhancing patient access to healthcare services, which also encompasses the integration and accessibility of telehealth services through these portals. Currently, there is no survey in place to gauge the degree of alignment between the newly implemented Finnish well-being reform and the existing Finnish patient portals. To facilitate this evaluation, a survey derived from the monitoring of the United States' healthcare reform monitoring (Inter-university Consortium for Political and Social Research, 2023) is used to acquire valuable insights and recommend proactive action to Finnish health policy makers. The health reform monitoring survey conducted in the USA in April 2021 (Inter-university Consortium for Political and Social Research, 2023) encompassed a total of 9067 participants. A sample size of 9067 participants was employed for a study of the US population, which exceeds 335 million (United State Census bureau, 2023), in contrast to the Finnish population, which is fewer than 6 million (Statistics Finland, 2023). The knowledge extracted from the sample size of 9,067 participants was deemed sufficient to explore and extract insights across a range of facets, including:

- Participants' health status.
- Places visited by participants based on their gender.
- Places visited by participants based on their health status.
- Places visited by participants based on their work status.
- Telehealth tools used by patients.
- General preventive care or routine care addressed during phone or video visits.
- Health care for a new injury, illness, or health problem other than COVID-19 issues addressed during phone or video visits.
- The lack of technology to access phone or video visits with a healthcare provider.

The health status of the survey participants was categorized into five distinct categories: The health status of the survey participants was categorized into five distinct categories: Excellent, Very good, Good, Fair and Poor. To generate the regression-adjusted results, the following estimating equation was used: $Results_i = \beta 0 + \beta 1(\text{health status}i) + \beta 2(\text{telehealth tools}i) + \beta 3(\text{place visited}i) + \beta 4(\text{working status}i)$. In this research, result represents a binary outcome variable, such as the number of telehealth tools used by individual with in the past 12 months. The binary outcome variable is attributed to the survey questions being answered with a "yes" or "no" response.

3. RESULTS

3.1 Systematic Search

The systematic search conducted in the PubMed database did not yield any articles associated with the assessment of newly implemented well-being counties reform and the existing Finnish patient portals, while 16 relevant results were obtained from the Finnish Journal of eHealth and eWelfare. Only four articles mentioned the new Finnish reform. The first article discussed how the reform necessitates the sharing of information between organizations and how the Kanta patient portal was implemented nationwide to facilitate this process (Jormanainen, 2018). The second article affirmed that the goal of the new reform is to motivate residents to be proactive in preserving and enhancing their own well-being (Keränen et al., 2023). The third article explained that the expected outcomes of the new national reform and the continued expansion of Kanta services may have somewhat hindered the regional development of non-Kanta alternatives (Rosenlund and Kinnunen, 2018). In the fourth article, the authors acknowledged that electronic services constitute a vital component of the Well-being Counties Reform 2020 strategy (Karisalmi et al., 2018). The goal is to move to integrated social and healthcare services that start from the customer's needs and are available uniformly and without barriers. The four screened articles (Figure 1) did not mention alignment of Finnish portals with the newly implemented Finnish wellbeing counties reform.

The results obtained from monitoring the US health reform yielded valuable insights patterns among the health status of the participants, the places they visited within the last 12 months, the telehealth tools they utilized and working status during the same period. The yielded results were shown below.

3.2 Health Status Result Among Males and Females

The survey health status result among males and females is depicted in Figure 2.

Figure 2 provided valuable insights into the health status of the participants. It is evident that the majority of both males and females reported excellent, very good, and good health, accounting for a total of (10.94%+37.29%+35.55%) 83.78% of males and (9.04%+34.01%+ 39.12%) 82.17% of females. On the other hand, the percentage of participants with fair and poor health status was (13.26%+ 2.96%) 16.22% among males and (15.16%+2.67%)17.83% among females.

3.3 Places Visited by Participants Based on Their Gender

The survey result of the places that participants visited is depicted in Figure 3.

According to the results presented in Figure 3, it is evident that both males and females predominantly visited doctor's office HOMs, clinics or health center, urgent care clinic and some other place. In other hand, participants showed comparatively lower visits rates to hospital emergency room, hospital outpatient department, and retail store clinic.

3.4 Places Visited by Participants Based on Their Health Status

Table 1 shows the places visited by participants based on their health status.

Figure 1. PRISMA flow diagram of literature search

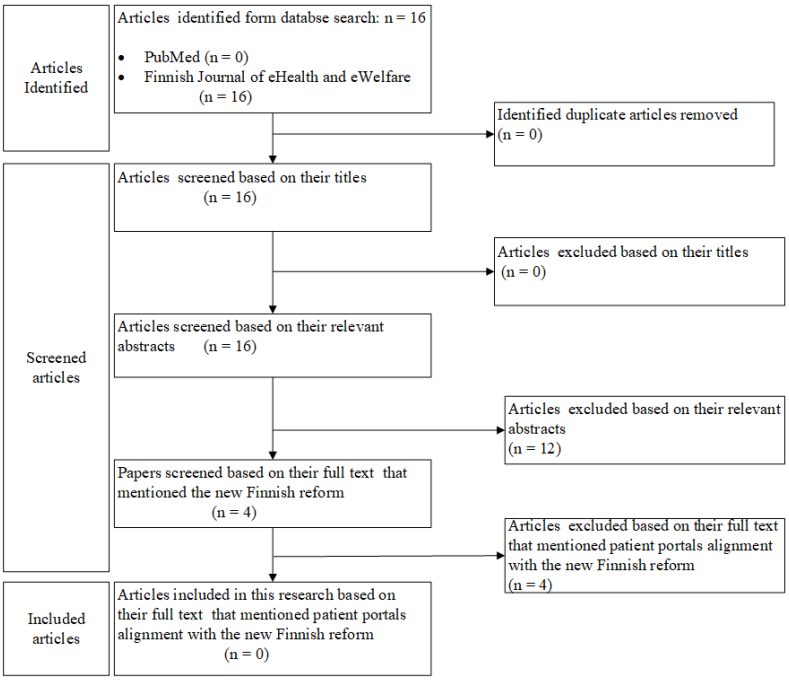


Figure 2. Participants' health status

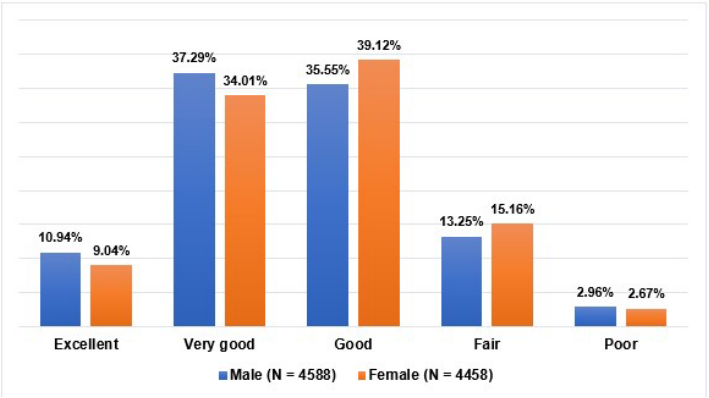


Table 1 demonstrates that the majority of participants reported being in good, very good, and excellent health status. The distribution of places visited by participants based on their health status closely mirrors the patterns observed in Figure 2, which is based on their gender.

3.5 Places Visited by Participants Based on Their Work Status

Table 2 shows the places visited by participants based on their working status.

Table 2 demonstrates that the majority of participants are either working as paid employees or are self-employed. The distribution of places visited by participants based on their work status closely corresponds to the patterns observed in Figure 2, which is based on their gender.

Figure 3. Places visited by participants gender

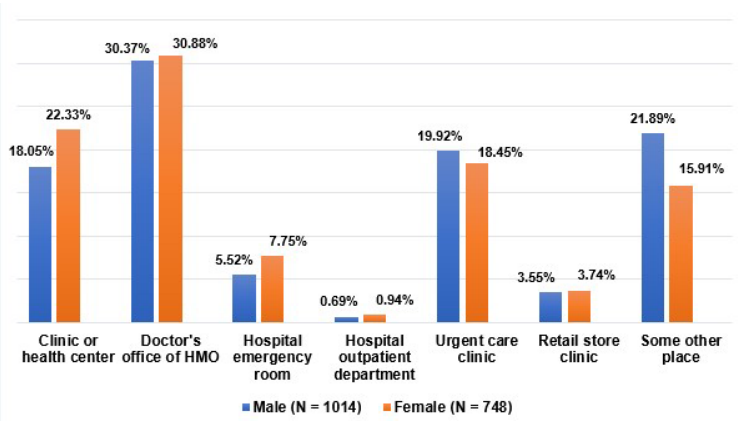


Table 1. Places visited by participants health status

Health status	Clinic or health center	Doctor's office of HMO	Hospital emergency room	Hospital outpatient department	Urgent care clinic	Retail store clinic	Some other place
Excellent (N = 214)	14.49%	33.64%	4.67%	0.47%	19.16%	3.27%	24.30%
Very good (N = 586)	20.82%	34.81%	3.92%	1.19%	19.28%	3.24%	16.72%
Good (N = 665)	21.05%	27.97%	7.97%	0.45%	20.75%	4.36%	17.44%
Fair (N = 244)	19.26%	26.23%	10.66%	0.82%	17.21%	2.875	22.95%
Poor (N = 48)	16.67%	27.08%	4.17%	0%	12.05%	2.08%	37.50%

Table 2. Places visited by participants work status

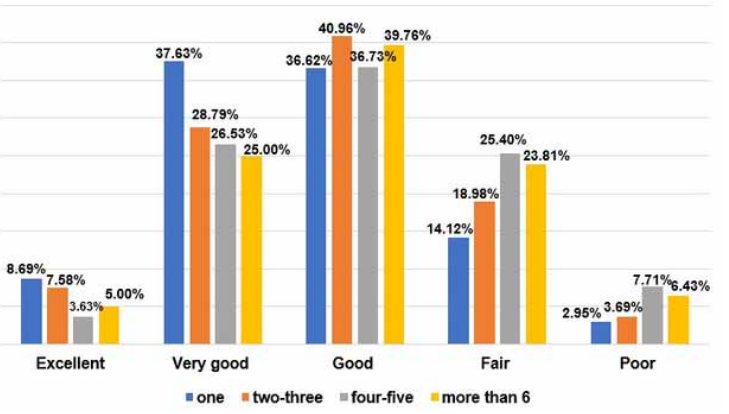
Working status	Clinic or health center	Doctor's office of HMO	Hospital emergency room	Hospital outpatient department	Urgent care clinic	Retail store clinic	Some other place
Working as paid employee (N = 1048)	19.08%	31.58%	4.40%	0.57%	23.09%	4.10%	17.08%
Working as self employed (N = 195)	20.00%	28.21%	6.15%	1.54%	15.90%	4.62%	23.59%
Not working on temporary layoff from a job (N = 36)	19.44%	27.78%	13.89%	2.78%	22.22%	0%	13.89%
Not working- loking for work (N = 167)	27.54%	24.55%	12.57%	0.60%	11.98%	2.40%	20.36%
Not working retired (N =74)	14.86%	45.95%	10.81%	0%	12.16%	0%	16.22%
Not working disabled (N= 71)	15.49%	35.21%	14.08%	0%	8.45%	0%	23.94%
Not working other (N = 171)	21.05%	25.15%	6%	1.75%	14.04%	3.515	28.07%

3.6 Telehealth Tools Results

Telehealth tools identified in the survey were phone and video visits. The results of phone and video visits based on participants health status are presented in Figure 4.

The analysis of phone and video visits based on participants' health status in Figure 4 revealed that individuals with very good and good health accounted for the majority of telehealth tool users. Conversely, participants with excellent and poor health were found to be the least likely to utilize telehealth tools, while those with fair health demonstrated moderate usage.

Figure 4. Phone and video visits based on participants health status



3.7 Result of General Preventive Care or Routine Care Addressed During Phone or Video Visits

The results of general preventive care or routine care addressed during phone or video visits are based on participants gender and health status of the participants.

The results of general preventive care or routine care addressed during phone or video visits based on participants gender are presented in Figure 5.

According to the results presented in Figure 5, approximately 60% of participants, both male and female, reported using telehealth tools (phone or video visits) for general preventive care or routine care. Conversely, approximately 40% of participants indicated using telehealth tools for non-general preventive care or routine care.

The results of general preventive care or routine care addressed during phone or video visits based on participants health status are presented in Figure 6.

Figure 6 reveals that more than half of the participants utilized telehealth tools (phone or video visits) irrespective of their health status. Moreover, a noticeable trend can be observed where the usage of telehealth tools for preventive care and routine care increases progressively from excellent to poor health.

Figure 5. Preventive or routine care addressed by phone or video visits based on gender

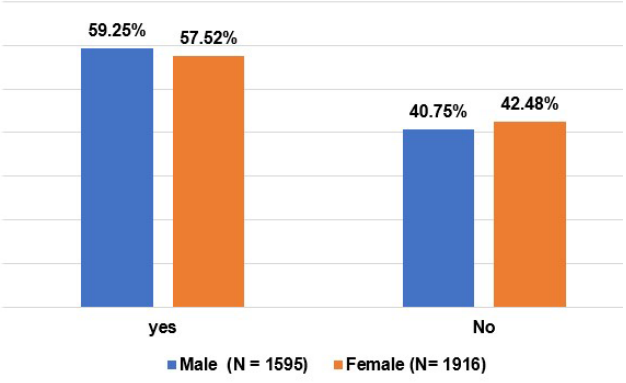
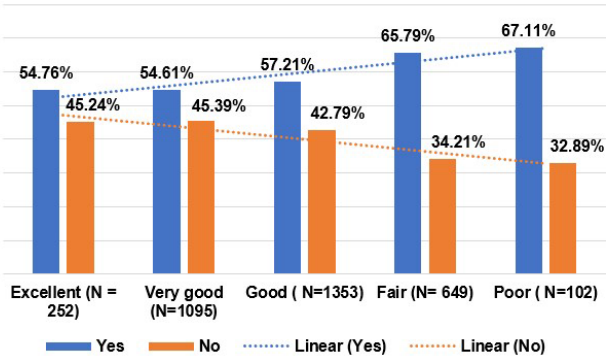


Figure 6. Preventive or routine care addressed by phone or video visits based on health status



3.8 Results of Non-COVID-19 Telehealth Visits in the Last 12 Months

The results of health care for a new injury, illness, or health problem other than COVID-19 addressed during phone or video visits based on participants health status are presented in Figure 7.

Figure 7 illustrates that over 70% of the participants, regardless of their health status, utilized telehealth tools for non-COVID-19 related concerns. Additionally, a discernible trend can be observed, indicating that the usage of telehealth tools for new injuries, illnesses, or health problems unrelated to COVID-19 increased gradually from excellent to poor health.

3.9 Results of Technology Barrier to Telehealth Visits

The results of lack of technology to get phone or video visits with a health care provider based on participants health status are presented in Figure 8.

Figure 8 shows that the lack of technology is not a significant barrier preventing participants, regardless of their health status, from accessing telehealth visits.

4. DISCUSSION

4.1 Promoting Patient Engagement and Self-Care to Foster Well-Being

Based on systematic search results (Figure 1) only four articles (Jormanainen, 2018; Keränen et al., 2018; Rosenlund and Kinnunen, 2018; Karisalmi et al., 2018) mentioned the new Finnish reform,

Figure 7. Telehealth visits for non-COVID-19 health issues

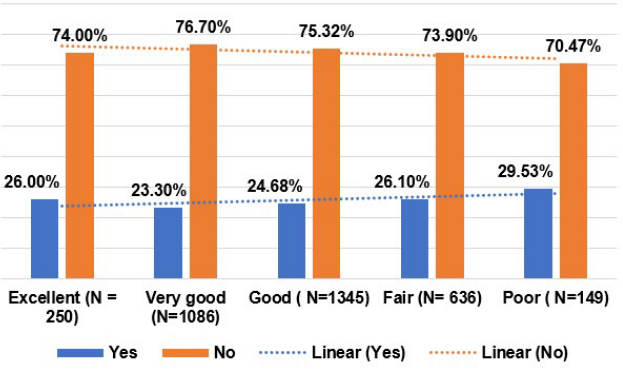
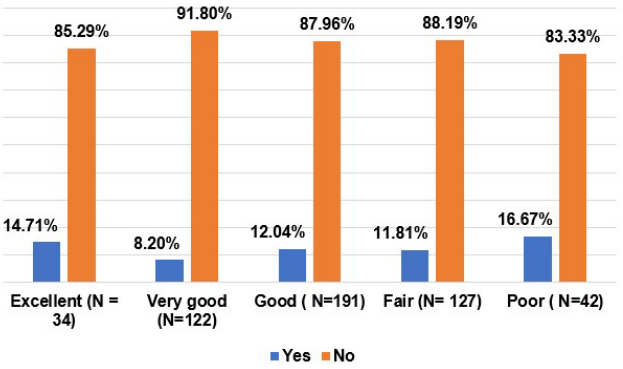


Figure 8. Technology barrier to telehealth visits



the first article sheds light on the significance of information sharing in the Finnish well-being reform, highlighting the nationwide implementation of the Kanta patient portal as a key facilitator (Jormanainen, 2018). In addition, the second article (Keränen et al., 2018) emphasizes that the primary objective of the reform is to empower residents to actively participate in preserving and enhancing their well-being. Recognizing the pivotal role patients play in managing their own health, the reform aims to create an environment that motivates and supports residents in adopting healthy behaviors, engaging in preventive measures, and making informed decisions about their healthcare. By promoting patient engagement and self-care, the reform seeks to foster a culture of wellness and proactive management of well-being. However, as discussed in the third article (Rosenlund and Kinnunen, 2018), the growth of the Kanta services and the anticipated outcomes of the national reform have potentially impacted the development of non-Kanta alternatives at the regional level. In the fourth article (Karisalmi et al., 2018), the authors centered their attention on the requirements of patients with heart disease, diabetes, or cancer. Their findings revealed that simply increasing the number of eHealth services is insufficient, as active patients also need supplementary information and guidance concerning these services. After analyzing the four screened articles (Figure 1) that made no reference to the alignment of Finnish portals with the recently implemented Finnish well-being counties reform, it can be concluded that there is a lack of studies evaluating the alignment between the current Finnish patient portals and the well-being reform. Such studies are crucial for achieving the reform's aims. The presence of numerous of Finnish patient portals with varying features and interfaces (Ruotanen et al., 2021; Machal and Värri, 2022) continue to introduce additional costs associated with their maintenance. Rather than having numerous portals, the implementation and upkeep of a unified nationwide patient portal would be cost-effective. A successful illustration of such approach can be seen in Denmark, where the use of a nationwide patient portal since 2009 enabled the Danish government to reduce healthcare costs (Jensen and Thorseng, 2017). While the focus on a nationwide patient portal is crucial for achieving consistency and standardization in healthcare services, it is also essential to consider the diverse regional contexts and the potential value of local initiatives. Facilitating a balance between the advantages of a unified nationwide portal and the need for regional flexibility and innovation becomes crucial to ensure comprehensive and patient-centered care across Finland. It is important to recognize that while the implementation of a nationwide patient portal like Danish portal (Jensen and Thorseng, 2017) can smooth information sharing and provide a patient centralized platform for healthcare services, it may unintentionally limit the growth of alternative regional solutions. This highlights the need to assess the impact of the reform on the development and availability of non-Kanta alternatives (Ruotanen et al., 2021). While the national reform aims to enhance patient engagement and well-being, it is equally important to ensure that regional healthcare services have the flexibility to address unique needs and leverage

local innovations. The examination of data (Figure 1, 2, 3,4, 5, 6, 7, 8 and Table 1, 2) from the US health reform monitoring provides valuable insights into various facets of healthcare, encompassing health status and utilization of healthcare facilities, telehealth tool adoption, technology as a barrier and the integration of telehealth tools into patient portals.

4.2 Health Status and Utilization of Healthcare Facilities

The research, illustrated in Figure 2, begins by examining the health status among male and female participants. Remarkably, a substantial majority of both males and females reported excellent, very good, or good health, accounting for 83.78% of males and 82.17% of females. In contrast, individuals reporting fair or poor health status constituted a smaller proportion, with 16.22% among males and 17.83% among females. This distribution of health status closely mirrors the goals of the Finnish well-being reform (Koivisto et al., 2018; Keskimäki et al., 2019; Koivisto et al.,2019), which seeks to address health inequalities and promote overall well-being. Intriguingly, this alignment between health status and healthcare utilization underscores the importance of tailored healthcare interventions, particularly for individuals with fair or poor health.

Turning to the utilization of healthcare facilities, Figure 3 reveals that both males and females predominantly visited doctor's offices, homes (HOMs), clinics or health centers, and urgent care clinics. The utilization of healthcare facilities corresponds with the traditional hierarchy of healthcare services, with primary care settings as the initial point of contact for healthcare needs. Table 1 presents the distribution of places visited by participants based on their health status. The places visited closely mirror the patterns observed in Figure 2, underscores the correlation between health status and healthcare-seeking behavior, with healthier individuals visiting healthcare facilities more frequently. Which suggest that health status plays a significant role in determining healthcare utilization. Participants with fair or poor health status tend to visit healthcare facilities less frequently. This observation needs to be taken in consideration by Finnish healthcare policymaker to streamline healthcare and social services into an integrated system. This integration facilitates easier access to healthcare services and, as seen in the US reform monitoring data that aligns with the preference for primary care settings. Thus, the Finnish reform's objective of improving coordination of healthcare and social services appears consistent with these utilization patterns. Table 2 presents the distribution of places visited by participants based on their work status. The majority of participants were either employed or self-employed, mirroring the patterns observed in Figure 2, which is based on gender. This observation suggests that employment status may play a role in healthcare utilization patterns, potentially influenced by access to healthcare benefits through employment.

4.3 Telehealth Tool Adoption

Telehealth tools, including integration into patient portals, are increasingly essential in healthcare delivery, as evident from the data monitoring US healthcare reform. Figure 4 provides insights into the use of telehealth tools (phone and video visits) based on participants' health status. It shows that individuals with very good and good health were more likely to use telehealth tools, while those with excellent and poor health were less likely to utilize them. Participants with fair health demonstrated moderate usage. Those in poor health may necessitate physical hospital visits, whereas individuals in excellent health rarely require healthcare services or hospital visits. This aligns with the emphasis of the Finnish Well-being Reform on preventive care, as individuals with better health often proactively engage in preventive measures. Additionally, Figure 5 displays the utilization of telehealth tools for general preventive care or routine care, categorized by gender. Approximately 60% of both male and female participants reported using telehealth for these purposes, indicating a substantial interest in preventive healthcare through telehealth tools. Similar pattern can be seen in Figure 6. This Figure 6 reveals that more than half of the participants utilized telehealth tools for preventive care or routine care, regardless of their health status. This suggests that telehealth tools are increasingly being utilized

for addressing new injuries, illnesses, or health problems, with a noticeable trend of increased usage from excellent to poor health.

The data presented in Figure 7 sheds light on the utilization of telehealth tools within the participant group. Notably, it is evident that a substantial majority, exceeding 70% of participants made use of telehealth services primarily for issues related to COVID-19, irrespective of their initial health status. However, a more nuanced trend becomes apparent when considering the participants' health status in relation to their telehealth usage for non-COVID-19-related health concerns. This trend reveals that as health status declines from excellent to poor, there is a progressive increase in the utilization of telehealth tools for addressing new injuries, illnesses, or health problems unrelated to COVID-19. This observation suggests that individuals with better initial health status may have been more inclined to rely on traditional in-person healthcare services for non-COVID-19 issues. In contrast, those with poorer health status may have found telehealth to be a more viable and accessible option, potentially due to their increased healthcare needs or limited mobility. Overall, the data in Figure 7 underscores the dual role of telehealth during the COVID-19 pandemic. Initially, it served as a crucial resource for addressing pandemic-related concerns. However, as the pandemic unfolded, it also became a valuable tool for managing a broader spectrum of health issues, particularly among individuals with lower health status, highlighting the evolving landscape of healthcare delivery.

4.4 Technology as a Barrier

The findings illustrated in Figure 8 provide important insights into the accessibility of telehealth services among the study participants, irrespective of their initial health status. Notably, this data indicates that technology does not appear to serve as a substantial barrier hindering participants from accessing telehealth visits. In a rapidly evolving healthcare landscape, where telehealth has become an increasingly prominent mode of healthcare delivery, the absence of significant technological barriers is a positive sign. It suggests that participants across a spectrum of health statuses have been able to overcome potential technological hurdles to access telehealth services. This observation underscores the adaptability and acceptance of telehealth technology among the population under study. It may also imply that healthcare providers and the US policymakers have made efforts to ensure equitable access to telehealth services (Thomas Craig et al., 2020; Singhal, 2022; Ganeshan et al., 2022; McCabe et al., 2022), addressing concerns related to digital literacy, access to devices, and reliable internet connectivity. Like the US, Finland is considered a country with well-established health informatics infrastructure (Kouri et al., 2018; Haverinen et al., 2022; Naumann et al., 2022) using patient portals to integrates telehealth services is highly encouraged. This is a critical finding given the importance of ensuring equal access to healthcare services, a principle central to both the Finnish well-being reform and the observations made in the US reform monitoring data study.

4.5 The Integration of Telehealth Tools Into Patient Portals

The integration of telehealth tools into patient portals and their alignment with the well-being reform are anticipated to result in four positive outcomes. Firstly, this alignment will facilitate a patient-centered approach to healthcare, promoting individual independence, engagement and empowerment (Brands et al., 2022; Gleason et al., 2022; Banguilan et al., 2022). Patients will have greater control over their health and play an active role in decision-making processes (Machal and Värri, 2022; Machal, 2022). Secondly, the integration of telehealth tools in patient portals will enhance patients' access to their health information, leading to improved health literacy and self-management (Chatterjee et al., 2021; van Olmen, 2022). Patients will be better equipped to understand their health conditions, make informed decisions, and take proactive measures for their well-being. Thirdly, this alignment will foster improved communication and collaboration between patients and healthcare providers (Värri et al., 2019; Janssen et al., 2022; Naumann and Berger, 2022). Patients will be able to securely communicate with their healthcare team, share information, and receive timely feedback and guidance (Sadhu et al., 2022). This enhanced collaboration will contribute to more personalized and effective

care and address the inequality issues in healthcare (Thomas Craig et al., 2020; Singhal et al., 2022; Ganeshan et al., 2022; McCabe et al., 2022). Fourthly, the incorporation of secure messaging and remote consultations within patient portals will offer patients convenient avenues to seek guidance and support from healthcare professionals. This will reduce the need for unnecessary physical visits, saving time and resources, and improving the overall efficiency of healthcare delivery (Curfman et al., 2022; Liu et al., 2022; Durocher et al., 2023).

Despite the expected four positive outcomes, there are challenges associated with aligning existing patient portals with the well-being reform. One major challenge is ensuring interoperability and data exchange between different systems and platforms (Gruendner et al., 2022; Alvarez-Romero et al., 2022). It is essential to establish seamless integration to enable the flow of information across healthcare services, guaranteeing comprehensive and up-to-date patient records that are important in deciding about the course of treatment for patients. Another consideration is the need for continuous evaluation and improvement of patient portals to address user experience (Khadjesari et al., 2023; Scheckel et al, 2023), accessibility (Alajarmeh, 2022), security and privacy concerns (European Data Protection Supervisor, 2022; Iqbal et al., 2022; d'Aliberti and Clark, 2022; Jordan et al., 2022; Krumholz, 2023). Therefore, it is crucial to ensure that the portals are user-friendly, accommodate diverse populations, and prioritize data security and privacy to ensure or improve the satisfaction of the patients.

5. CONCLUSION

The Finnish well-being reform, implemented across 21 counties in January 2023, represents a significant transformation of healthcare services with a focus on enhancing care quality, patient engagement, and overall well-being. Central to this reform is the integration of patient portals, digital tools that empower individuals to access their health information, communicate with healthcare providers, and actively participate in their healthcare decisions. The objective of this research was to assess the alignment between existing Finnish patient portals and the well-being reform, drawing a proactive insight from US healthcare reform monitoring. The insights from US healthcare reform monitoring can be summarized in six key findings:

1. **Limited research:** The study identified a lack of research assessing the alignment between Finnish patient portals and the well-being reform. This gap underscores the need for comprehensive evaluations to ensure the reform's success.
2. **Unified nationwide portal:** Implementing a unified nationwide patient portal, akin to Denmark's model, could improve cost-effectiveness and standardization in healthcare services. Additionally, it is crucial to strike a harmonious balance with regional adaptability and creativity to guarantee the delivery of patient-centric care.
3. **Telehealth adoption:** Telehealth tools, integrated into patient portals, play a pivotal role in healthcare delivery. The study found that patients with better health status were more likely to use telehealth, emphasizing the importance of preventive care. The COVID-19 pandemic accelerated telehealth adoption for non-pandemic-related health concerns, especially among those with lower health status.
4. **Technology barriers:** Technology barriers to accessing telehealth services were not a significant hindrance among study participants, suggesting adaptability and acceptance of telehealth technology. This aligns with Finland's strong health informatics infrastructure.
5. **Positive outcomes:** The integration of telehealth tools into patient portals is expected to yield four positive outcomes: patient-centered care, improved health literacy, enhanced communication between patients and providers, and efficient healthcare delivery.

6. **Challenges:** Challenges include ensuring patient portals interoperability and data exchange between systems, user-friendly portals, accessibility, and addressing security and privacy concerns.

In summary, aligning Finnish patient portals with the well-being reform is pivotal for achieving the reform's objectives. While challenges exist, the potential benefits in terms of patient engagement, health outcomes, and efficiency underscore the importance of continued efforts in this direction. The experiences from the US healthcare reform monitoring provide valuable insights for Finnish policymakers as they navigate this transformative journey toward a more patient-centered and digitally-enabled healthcare system.

CONFLICTS OF INTEREST

None declared.

REFERENCES

Alajarmeh, N. (2022). Evaluating the accessibility of public health websites: An exploratory cross-country study. *Universal Access in the Information Society*, *21*(3), 771–789. doi:10.1007/s10209-020-00788-7 PMID:33526996

Alvarez-Romero, C., Martínez-García, A., Sinaci, A. A., Gencturk, M., Méndez, E., Hernández-Pérez, T., & Calderón, C. L. P. et al. (2022). FAIR4Health: Findable, accessible, interoperable and reusable data to foster health research. *Open Research Europe*, 2. PMID:37645268

Banguilan, K. L., Sonnenberg, F., & Chen, C. (2022). Physicians' Perspectives on Inpatient Portals: Systematic Review. *Interactive Journal of Medical Research*, *11*(2), e39542. doi:10.2196/39542 PMID:36378521

Brands, M. R., Gouw, S. C., Beestrum, M., Cronin, R. M., Fijnvandraat, K., & Badawy, S. M. (2022). Patient-Centered Digital Health Records and Their Effects on Health Outcomes: Systematic Review. *Journal of Medical Internet Research*, *24*(12), e43086. doi:10.2196/43086 PMID:36548034

Carini, E., Villani, L., Pezzullo, A. M., Gentili, A., Barbara, A., Ricciardi, W., & Boccia, S. (2021). The impact of digital patient portals on health outcomes, system efficiency, and patient attitudes: Updated systematic literature review. *Journal of Medical Internet Research*, *23*(9), e26189. doi:10.2196/26189 PMID:34494966

Chatterjee, A., Prinz, A., Gerdes, M., & Martinez, S. (2021). Digital Interventions on Healthy Lifestyle Management: Systematic Review. *Journal of Medical Internet Research*, *23*(11), e26931. doi:10.2196/26931 PMID:34787575

Cresswell, K., Rigby, M., Georgiou, A., Wong, Z. S., Kukhareva, P., Medlock, S., De Keizer, N. F., Magrabi, F., Scott, P., & Ammenwerth, E. (2022). The Role of Formative Evaluation in Promoting Digitally-based Health Equity and Reducing Bias for Resilient Health Systems: The Case of Patient Portals. *Yearbook of Medical Informatics*, *31*(1), 33–39. doi:10.1055/s-0042-1742498 PMID:35654424

Curfman, A., Hackell, J. M., Herendeen, N. E., Alexander, J., Marcin, J. P., Moskowitz, W. B., ... Committee On Pediatric Workforce. (2022). Telehealth: opportunities to improve access, quality, and cost in pediatric care. In *Pediatric Telehealth Best Practices* (pp. 43-173). American Academy of Pediatrics.

d'Aliberti, O. G., & Clark, M. A. (2022). Preserving Patient Privacy During Computation over Shared Electronic Health Record Data. *Journal of Medical Systems*, *46*(12), 85. doi:10.1007/s10916-022-01865-5 PMID:36261623

Durocher, K., Shin, H. D., Lo, B., Chen, S., Ma, C., & Strudwick, G. (2023). Understanding the Role of Patient Portals in Fostering Interprofessional Collaboration Within Mental Health Care Settings: Mixed Methods Study. *JMIR Human Factors*, *10*, e44747. doi:10.2196/44747 PMID:37467024

European Data Protection Supervisor. (2022). *The General Data Protection Regulation*. https://edps.europa.eu/data-protection/our-work/subjects/health_en

Finnish Ministry of Social Affairs and Health. (2021). *Government proposal for health and social services reform and related legislation adopted by Parliament*. Available from: https://stm.fi/en/-/government-proposal-for-health-and-social-services-reform-and-related-legislation-adopted-by-parliament

Ganeshan, S., Pierce, L., Mourad, M., Judson, T. J., Kohli, M. D., Odisho, A. Y., & Brown, W. III. (2022). Impact of patient portal-based self-scheduling of diagnostic imaging studies on health disparities. *Journal of the American Medical Informatics Association : JAMIA*, *29*(12), 2096–2100. doi:10.1093/jamia/ocac152 PMID:36063414

Gleason, K. T., Peereboom, D., Wec, A., & Wolff, J. L. (2022). Patient portals to support care partner engagement in adolescent and adult populations: A scoping review. *JAMA Network Open*, *5*(12), e2248696–e2248696. doi:10.1001/jamanetworkopen.2022.48696 PMID:36576738

Gruendner, J., Deppenwiese, N., Folz, M., Köhler, T., Kroll, B., Prokosch, H. U., Rosenau, L., Rühle, M., Scheidl, M.-A., Schüttler, C., Sedlmayr, B., Twrdik, A., Kiel, A., & Majeed, R. W. (2022). The architecture of a Feasibility Query Portal for Distributed COVID-19 Fast Healthcare Interoperability Resources (FHIR) patient data repositories: Design and implementation study. *JMIR Medical Informatics*, *10*(5), e36709. doi:10.2196/36709 PMID:35486893

Haverinen, J., Keränen, N., Tuovinen, T., Ruotanen, R., & Reponen, J. (2022). National development and regional differences in eHealth maturity in Finnish public health care: Survey study. *JMIR Medical Informatics*, *10*(8), e35612. doi:10.2196/35612

Inter-university Consortium for Political and Social Research (ICPSR). (2021). *Health Reform Monitoring Survey, United States*. 10.3886/ICPSR38526.v1

Iqbal, Y., Tahir, S., Tahir, H., Khan, F., Saeed, S., Almuhaideb, A. M., & Syed, A. M. (2022). A Novel Homomorphic Approach for Preserving Privacy of Patient Data in Telemedicine. *Sensors (Basel)*, *22*(12), 4432. doi:10.3390/s22124432 PMID:35746213

Janssen, A., Keep, M., Selvadurai, H., & Shaw, T. (2023). Health professionals' experiences with a patient portal pre and post launch: A qualitative study. *Health Policy and Technology*, *12*(3), 100761. doi:10.1016/j.hlpt.2023.100761

Jensen, T. B., & Thorseng, A. A. (2017). Building national healthcare infrastructure: the case of the Danish e-health portal. Information Infrastructures within European Health Care: Working with the Installed Base, 209-224.

Jordan, S., Fontaine, C., & Hendricks-Sturrup, R. (2022). Selecting Privacy-Enhancing Technologies for Managing Health Data Use. *Frontiers in Public.*

Jormanainen, V. (2018). Large-scale implementation and adoption of the Finnish national Kanta services in 2010–2017: A prospective, longitudinal, indicator-based study. *Finnish Journal of eHealth and eWelfare, 10*(4), 381-395.

Keskimäki, N., Kaipio, J., & Kujala, S. (2018). The role of healthcare personnel in motivating and guiding patients in the use of eHealth services. *Finnish Journal of EHealth and EWelfare*, *10*(2-3), 210–220. doi:10.23996/fjhw.69145

Keränen, N., Tuovinen, T., Haverinen, J., Ruotanen, R., Reponen, J. (2022). Regional health information exchange outside of the centralized national services for public health care in Finland: a national survey. *Finnish Journal of eHealth and eWelfare, 14*(1), 31-42.

Keskimaki, I., Tynkkynen, L. K., Reissell, E., Koivusalo, M., Syrja, V., Vuorenkoski, L., & Karanikolos, M. (2019). Finland: Health System Review. *Health Systems in Transition*, *21*(2), 1–166. PMID:31596240

Khadjesari, Z., Houghton, J., Brown, T. J., Jopling, H., Stevenson, F., & Lynch, J. (2023). Contextual Factors That Impact the Implementation of Patient Portals With a Focus on Older People in Acute Care Hospitals: Scoping Review. *JMIR Aging*, *6*, e31812. doi:10.2196/31812 PMID:36735321

Koivisto, J. (2018). Modular approach in managing and organising integrated care in the system-wide reform of social and health care in Finland. *International Journal of Integrated Care*, *18*(s2), 195. doi:10.5334/ijic.s2195

Koivisto, J., Liukko, E., & Tiirinki, H. (2019). Enacting integrated care in the system-wide social and health care reform in Finland. *International Journal of Integrated Care*, *19*(4), 19. doi:10.5334/ijic.s3097

Kouri, P., Reponen, J., Ahonen, O., Metsäniemi, P., Holopainen, A., & Kontio, E. (2018). Telemedicine and eHealth in Finland: on the way to digitalization–from individual telehealth applications to connected health. *A Century of Telemedicine: Curatio Sine Distantia et Tempora A World Wide Overview–Part II*.

Krumholz, H. M. (2023). In the US, patient data privacy is an illusion. *BMJ (Clinical Research Ed.)*, *381*, 1225. doi:10.1136/bmj.p1225 PMID:37263657

Lear, R., Freise, L., Kybert, M., Darzi, A., Neves, A. L., & Mayer, E. K. (2022). Perceptions of Quality of Care Among Users of a Web-Based Patient Portal: Cross-sectional Survey Analysis. *Journal of Medical Internet Research*, *24*(11), e39973. doi:10.2196/39973 PMID:36394922

Liu, S. K., Osborn, A. E., Bell, S., Mecchella, J. N., Hort, S., & Batsis, J. A. (2022). Patient characteristics and utilization of an online patient portal in a rural academic general internal medicine practice. *BMC Medical Informatics and Decision Making*, *22*(1), 1–6. doi:10.1186/s12911-022-01778-w PMID:35172805

Machal, M. L. (2022, November). Patients and Organizations eHealth Services Model. In *International Conference on WearableMicro and Nano Technologies for Personalized Health* (pp. 283-286). IOS Press.

Machal, M. L., & Värri, A. (2022). Development Towards Patient-Centered eHealth Services in Finland. In *Challenges of Trustable AI and Added-Value on Health* (pp. 707–708). IOS Press. doi:10.3233/SHTI220563

McCabe, C. F., Wood, G. C., Franceschelli-Hosterman, J., Cochran, W. J., Savage, J. S., & Bailey-Davis, L. (2022). Patient-reported outcome measures can advance population health, but is access to instruments and use equitable? *Frontiers in Pediatrics*, *10*, 892947. doi:10.3389/fped.2022.892947 PMID:36330368

National Library of Medicine. (2023). *MedlinePlus. Patient portals - an online tool for your health.* Available from: https://medlineplus.gov/ency/patientinstructions/000880.htm

Naumann, L., & Berger, H. (2022). Health IT Across Health Care Systems: Finland, Germany and the US. In *Nursing Informatics: A Health Informatics, Interprofessional and Global Perspective* (pp. 725–739). Springer International Publishing. doi:10.1007/978-3-030-91237-6_45

Nelson, L. A., Reale, C., Anders, S., Beebe, R., Rosenbloom, S. T., Hackstadt, A., Harper, K. J., Mayberry, L. S., Cobb, J. G., Peterson, N., Elasy, T., Yu, Z., & Martinez, W. (2023). Empowering patients to address diabetes care gaps: Formative usability testing of a novel patient portal intervention. *JAMIA Open*, *6*(2), ooad030. Advance online publication. doi:10.1093/jamiaopen/ooad030 PMID:37124675

Nøst, T. H., Faxvaag, A., & Steinsbekk, A. (2021). Participants' views and experiences from setting up a shared patient portal for primary and specialist health services- a qualitative study. *BMC Health Services Research*, *21*(1), 171. doi:10.1186/s12913-021-06188-8 PMID:33627122

Rosenlund, M., Kinnunen, U. M. (2018). Ikäihmisten kokemukset terveydenhuollon sähköisten palvelujen käytöstä ja kokemusten hyödyntäminen palvelujen kehittämisessä–kuvaileva kirjallisuuskatsaus. *Finnish Journal of eHealth and eWelfare, 10*(2-3), 264-284.

Ruotanen, R., Kangas, M., Tuovinen, T., Keränen, N., Haverinen, J., Reponen, J. (2021). Finnish e-health services intended for citizens–national and regional development. *Finnish Journal of eHealth and eWelfare, 13*(3), 283-301.

Sadhu, P. K., Yanambaka, V. P., Abdelgawad, A., & Yelamarthi, K. (2022). Prospect of internet of medical things: A review on security requirements and solutions. *Sensors (Basel)*, *22*(15), 5517. doi:10.3390/s22155517 PMID:35898021

Scheckel, B., Schmidt, K., Stock, S., & Redaèlli, M. (2023). Patient Portals as Facilitators of Engagement in Patients With Diabetes and Chronic Heart Disease: Scoping Review of Usage and Usability. *Journal of Medical Internet Research*, *25*, e38447. doi:10.2196/38447 PMID:37624629

Sieck, C. J., Hefner, J. L., & McAlearney, A. S. (2018). Improving the patient experience through patient portals: Insights from experienced portal users. *Patient Experience Journal*, *5*(3), 47–54. doi:10.35680/2372-0247.1269

Singh, S., Polavarapu, M., & Arsene, C. (2023). Changes in patient portal adoption due to the emergence of COVID-19 pandemic. *Informatics for Health & Social Care*, *48*(2), 125–138. doi:10.1080/17538157.2022.2070069 PMID:35473512

Singhal, S. (2022). Making Patient Care Bilingual: Improving Equitable Access to Patient Care Through Spanish MyChart Patient Portal. *Academic Medicine*, *97*(6), 778. doi:10.1097/ACM.0000000000004484 PMID:34709204

Sipanoun, P., Oulton, K., Gibson, F., & Wray, J. (2022). The experiences and perceptions of users of an electronic patient record system in a pediatric hospital setting: A systematic review. *International Journal of Medical Informatics*, *160*, 104691. doi:10.1016/j.ijmedinf.2022.104691 PMID:35091287

Sote-uudistus. (2023). *Establishment of wellbeing services counties and reform of the organisation of health, social and rescue services*. https://soteuudistus.fi/documents/16650278/92491799/Sote-+ja+pelastustoimen+uudistus_laaja_englanti+7.10.pdf/f15f9156-76da-fda9-5e42-13d5cf11d745/Sote-+ja+pelastustoimen+uudistus_laaja_englanti+7.10.pdf?t=1661257156633

Statistics Finland. (2023). *Finland's preliminary population Fig 5,550,066 at the end of February.* Available at: https://www.stat.fi/til/vamuu/2022/02/vamuu_2022_02_2022-03-22_tie_001_en.html

Thomas Craig, K. J., Fusco, N., Lindsley, K., Snowdon, J. L., Willis, V. C., Arriaga, Y. E., & Dankwa-Mullan, I. (2020). Rapid review: Identification of digital health interventions in atherosclerotic-related cardiovascular disease populations to address racial, ethnic, and socioeconomic health disparities. *Cardiovascular Digital Health Journal*, *1*(3), 139–148. doi:10.1016/j.cvdhj.2020.11.001 PMID:35265886

United State Census bureau. (2023). *U.S. and World Population Clock*. Available at: https://www.census.gov/popclock/

van Olmen, J. (2022). The Promise of Digital Self-Management: A Reflection about the Effects of Patient-Targeted e-Health Tools on Self-Management and Wellbeing. *International Journal of Environmental Research and Public Health*, *19*(3), 1360. doi:10.3390/ijerph19031360 PMID:35162383

Värri, A. O., Kinnunen, U.-M., Pöyry-Lassila, P., & Ahonen, O. (2019). The national SotePeda 24/7 project develops future professional competencies for the digital health and social care sector in Finland. *Finnish Journal of EHealth and EWelfare*, *11*(3), 232–235. doi:10.23996/fjhw.77605

Zachrison, K. S., Yan, Z., Sequist, T., Licurse, A., Tan-McGrory, A., Erskine, A., & Schwamm, L. H. (2023). Patient characteristics associated with the successful transition to virtual care: Lessons learned from the first million patients. *Journal of Telemedicine and Telecare*, *29*(8), 621–631. doi:10.1177/1357633X211015547 PMID:34120506

Marlon Luca Machal is widely acknowledged as a visionary in the healthcare industry, at the forefront of integrating patient portals and digital health solutions into modern healthcare systems. With a background encompassing health policy, pharmaceutical and medical device design, quality and regulatory affairs, connected drug delivery systems, and healthcare systems, the author's keen insights have recognized the transformative potential of digital health in healthcare delivery. Throughout an illustrious career, the author has consistently demonstrated unwavering dedication to promoting and implementing digital solutions to improve patient care and streamline healthcare delivery. The author has played a crucial role in challenging various global health policies, advocating for the widespread adoption of patient portals to empower patients and enhance communication between healthcare providers and their patients.