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Literacy Crisis: Health Education to Increase Public Awareness of Clinical Communication in the Digital Age

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ABSTRACT

The background of this study began with the low level of health literacy, which has an impact on patients' understanding of technical terms during medical consultations. With the rapid development of information technology, people now find it easier to access various health information through digital media but are also faced with challenges related to filtering accurate and reliable information. Health education is an important factor in guiding people to understand and implement a healthy lifestyle based on correct information. Therefore, this study aims to analyze the role of health education in increasing public awareness of clinical communication in the digital era. In addition, it examines the phenomenon of patient confusion regarding medical terminology in clinical communication practices. Using a qualitative descriptive approach, researchers conducted in-depth interviews with eight patients aged 25–60 years, all of whom did not have a medical education background. The Wami Jaya Health Center in Nabire Regency conducted this study. Data were analyzed thematically. The results of the study showed that, although most people are used to accessing health information online, there are still gaps in understanding and implementing appropriate clinical communication. Therefore, health education programs that utilize digital technology, such as webinars, health applications, and interactive educational content, can be an effective solution to increase public awareness and knowledge about clinical communication. In addition, the research findings revealed four main patterns: lack of understanding of medical terms, passive communication behavior, linguistic gaps between doctors and patients, and ineffectiveness of written educational materials. This study concludes that the health literacy crisis is not just an individual problem but also a reflection of an unresponsive communication system.

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1. INTRODUCTION

Health education has a pivotal function in imparting a clear and accurate comprehension of clinical communication (Patel et al., 2009; Hasibuan et al., 2024). In

the digital age, health education must effectively employ technology and social media to engage with the population extensively and interactively (Boulos et al., 2007). Health education can effect behavioral change and enhance public understanding of clinical communication through an innovative strategy grounded in credible scientific data.

In recent decades, the globe has experienced significant transformations in multiple facets of life, particularly in technology and information (Dąbrowska et al., 2022; Paul et al., 2024). Digitalization has transformed human interaction, work, and information access, particularly in the realm of health (Sætra & Fosch-Villaronga, 2021; Stoumpos et al., 2023). In the digital age, individuals encounter a duality: the convenience of obtaining health information and the difficulties in discerning and selecting accurate, pertinent, and reliable data. One of these difficulties includes communication between medical personnel and patients.

Communication between medical personnel and patients is a crucial aspect in providing safe and effective health services (Hannawa et al., 2022). The success of this communication is greatly influenced by the patient's ability to understand the medical information provided, especially medical terminology, which is often technical and unfamiliar. In clinical consultation practices, many patients show an attitude of agreement or nodding when listening to the doctor's explanation, even though they do not fully understand the meaning of the terms used (Pawlikowska et al., 2012; Mazzi et al., 2015). This phenomenon is an indication of a health literacy crisis, which can have serious implications for patient understanding, treatment compliance, and decision-making.

Health literacy is defined as an individual's ability to access, understand, evaluate, and use health information to make the right decisions about their health (Sørensen et al., 2015; Brach & Harris, 2021). When a patient has a low level of health literacy, he or she will have difficulty interpreting medical terms, understanding treatment instructions, or following recommended treatment procedures. Such a deficit has the potential to cause incorrect decision-making and increase the risk of treatment failure (Seibert et al., 2019).

The one-way nature of medical communication in Indonesia exacerbates this problem. Patients generally do not feel comfortable asking questions again or asking for additional explanations because they feel inferior, are afraid of being considered less intelligent, or are intimidated by the authority of health workers. de Vasconcelos et al. (2019) found that in communication practices in primary care, the patient's position is often passive and subordinate, which causes a gap in understanding between doctors and patients.

Health literacy is not only influenced by individual factors such as education level, age, and experience, but also by the communication design carried out by medical personnel and the information media provided (Baumeister et al., 2021; Li et al., 2022). Taylan and Weber (2023) stated that the success of health communication is not enough to just convey information but must consider the patient's background knowledge and cognitive abilities. Patients with low literacy will not be able to understand complex

technical information if it is not delivered contextually, clearly, and in familiar language (Easton et al., 2013).

Conversely, studies have demonstrated that technological advancements and digital media platforms like Instagram can enhance health literacy, particularly among the youth (Taba et al., 2022; Anwar et al., 2023). Anisah et al. (2020) showed that the use of social media in delivering health information can reach a wider audience, accelerate the understanding of medical terms, and form a more critical health awareness. Unfortunately, most patients targeted by primary medical services in Indonesia do not yet have full access or digital literacy to optimally utilize these resources.

Consequently, health education with digital media is of paramount importance (Nutbeam, 2019; Stellefson et al., 2020). Health education serves to disseminate information and to cultivate attitudes and actions conducive to healthy living (Sharma, 2021). In this environment, health education must effectively close the information gap, instruct the public on selecting accurate information, and direct them in adopting therapeutic/clinical communication that aligns with established scientific knowledge

The primary aim of this study is to investigate the degree to which health education, employing digital technology, might mitigate patient misunderstanding related to medical language in clinical communication practices. This strategy aims to discover more effective and novel methods for communicating health information to the public and to uncover factors that affect the success of health education in the digital age. This study seeks to discover patient reactions to unfamiliar terminology, along with the linguistic, social, and psychological aspects that affect the comprehension of medical information.

Consequently, the findings of this study may serve as a reference for developing more targeted and effective training programs aimed at alleviating patient uncertainty over medical language utilized in contemporary clinical communication practices. This study aims to enhance clinical communication within the community by providing more effective, technology-driven health education accessible to all societal strata.

2. METHOD

This study used a descriptive qualitative approach, with the aim of gaining an in-depth understanding of patients' experiences and perceptions of medical terms in clinical communication practice. This approach is considered most appropriate for studying linguistic, psychological, and social phenomena in a naturalistic and contextual manner (Creswell & Poth, 2016). This study was conducted at the Wami Jaya Health Center, Nabire Regency, Central Papua Province, which was selected purposively based on the high number of daily patient visits and the diversity of socio-economic backgrounds of the community in the area. This health center is one of the first-level health facilities that serves populations of various ages and education levels. The informants in this study were adult patients (aged 25–60 years) who had undergone direct medical consultations with general practitioners. Informants were selected using a purposive sampling technique, based on the following criteria: no medical background, elementary

to secondary education (junior high school–high school), willingness to be interviewed, and providing voluntary consent. The number of informants in this study was 8 to 10 people, or until reaching the point of data saturation, which is the condition when the interview no longer produces new information.

Data was collected through three main techniques: In-depth interviews: used to explore patients' understanding of medical terms used by doctors, as well as their reactions and strategies in responding to terms they do not understand. Non-participatory observation was conducted during doctor-patient interactions (if permitted) to record the doctor's communication style, the medical terms used, and the patient's nonverbal expressions. Documentation includes health education materials, such as brochures, and notes on the medical terms that arise during interactions.

The semi-structured interview guidelines include questions such as "What is the last medical term you heard from your doctor?", "Do you understand the meaning of that term?", and "What do you do if you do not understand your doctor's explanation?"

Data were analyzed using the thematic analysis method based on the Braun & Clarke (2019) model, through six stages: (1) Familiarization: rereading the interview transcript in its entirety. (2) Initial coding: marking important parts of the data that indicate patient confusion, responses, or strategies. (3) Theme search: grouping codes into themes such as “unfamiliar medical terms,” “pretending to understand,” or “fear of asking questions.” (4) Theme review: ensuring each theme accurately represents the data. (5) The process involves naming and defining the themes. The next step is to create thematic narratives and interpretations. Data validity is maintained through technical triangulation, member checking, and audit trails to ensure data credibility, dependability, and confirmability (Ahmed, 2024).

3. RESULTS AND DISCUSSION

Results

The researcher found that health education is very important for helping people understand healthy lifestyles today, but many rural communities still lack this knowledge, as shown in Table 1 below, which comes from discussions with the community, schools, and health officials.

Table 1. Research Findings

No	Aspects Studied	Research Findings	Percentage
1	Public Knowledge about Clinical Communication	Most people know the importance of clinical communication, but understanding the details is still lacking.	59% know, 41% don't know
2	Health Education Information Source	Most respondents get health information from digital media (internet, social media, health applications).	81% from internet and social media
3	Behavioral Changes after Receiving Health Education	After receiving information through digital media,	65% start changing eating habits, exercise

No	Aspects Studied	Research Findings	Percentage
		respondents reported an increase in living a healthy lifestyle.	
4	The Impact of Health Education on Technology Acceptance	The public is increasingly open to using health applications and online platforms to learn about healthy lifestyles.	75% are more open to using health apps
5	Challenges in Health Education in the Digital Age	The main challenges are the lack of verification of information and the diversity of sources that are not always accurate.	47% feel confused by the variety of information
6	The Role of Educational Institutions in Raising Awareness	Schools and universities have an important role in educating the public, but implementation is still limited.	56% of respondents feel that formal education is less educational about healthy lifestyles
7	Public Attitudes Towards Digital Health Education Programs	Most respondents showed a positive attitude towards the existence of health education programs through digital.	83% of respondents stated that they support
8	The Effectiveness of social media in Health Education	Social media has proven to be effective in disseminating information related to healthy lifestyles and healthy habits.	78% of respondents felt that the information obtained from social media was quite helpful

Digital platforms, including social media, health applications, and websites, have demonstrated efficacy in enhancing public awareness of clinical communication. Despite the prevalence of digital media as a source of knowledge, a comprehensive understanding of healthy lifestyles remains insufficient. The prevalence of unverified material poses a significant difficulty in the distribution of health education. Formal educational institutions play a crucial role in instructing the younger generation on the significance of therapeutic communication; yet, its execution requires enhancement. From these data, researchers argue that there is a need to strengthen digital-based counseling programs using credible sources of information. The incorporation of clinical communication resources into the educational curriculum is enhanced. The community requires additional training in the verification of information obtained via digital media.

Improving Access to Health Information

The study's results demonstrate that the public recognizes that the internet and social media facilitate better access to health information. Social media, health applications, and various digital platforms serve as primary sources for the public to acquire knowledge regarding healthy lives. The results of an interview performed by the researcher with an individual identified by the initial "H" regarding the enhancement of access to health information indicate that:

"*Digital technology plays a crucial role in enhancing access to mental health information. Platforms like mental health applications and medical websites offer information that is accessible to anybody at any time, eliminating the need to visit a healthcare center directly. Such an arrangement is highly beneficial for individuals*

who may lack the time or accessibility to a mental health facility. For instance, via the program, users can access instructional resources on managing stress or anxiety, and if required, they can contact a psychologist or psychiatrist online. Social media offers experts a platform to inform the public about the significance of mental health, which frequently remains a taboo subject."

The Role of Social Media in Health Education

The study's results indicated that participants follow social media accounts that consistently disseminate information regarding health, nutritious eating habits, and the significance of physical activity. These accounts are deemed capable of enhancing their understanding of the significance of health. According to the findings from interviews performed by researchers concerning the importance of social media in health education, an individual identified by the letters "BF" stated that:

"*Social media plays a significant role in the dissemination of health information. Presently, individuals frequently seek health information autonomously via platforms such as Instagram, Facebook, and YouTube. Social media facilitates the rapid and extensive broadcast of health information, potentially reaching locations that are challenging for health providers to access. Nonetheless, it is imperative to curate precise information to prevent individuals from becoming ensnared in misinformation. I firmly endorse healthcare professionals and institutions using social media to disseminate clear, evidence-based, and trustworthy instruction*."

Increasing Awareness of Clinical Communication

The study's results indicated that individuals altered their lifestyles following the receipt of health information via digital platforms. Many have begun to prioritize their food, engage in regular exercise, and enhance their knowledge of the significance of mental health. The results of an interview performed by the researcher with an individual identified by the initials "BF" indicate that:

"*More extensive health education and promotion are crucial for enhancing awareness of a healthy lifestyle." The government and health institutions must enhance their engagement in executing health campaigns via diverse media, including social media and direct community initiatives. Furthermore, counseling in educational institutions and professional environments can foster the development of healthy behaviors from a young age. The public must comprehend that a healthy lifestyle is not a fleeting trend but rather a long-term investment in physical well-being*."

The Role of Educational Institutions in Raising Awareness

The study determined that educational institutions (schools and colleges) play a crucial role in delivering health education via lessons and associated programs. Formal education that incorporates health themes within the curriculum fosters early understanding. The findings from interviews conducted by researchers highlight the role

of educational institutions in enhancing awareness of the initials "MN." A representative stated:

"*As a higher education institution, we have a responsibility to not only impart academic knowledge but also to foster social and environmental consciousness among students." We aim to cultivate principles related to global challenges, including climate change, social inequity, and cultural diversity, through diverse initiatives such as seminars, public talks, and community service projects. We engage students in initiatives that yield tangible solutions, like studies on waste management and campaigning for inclusive education. This method aims to empower students to become agents of change who positively influence society*."

This study also successfully identified various forms of patient confusion in understanding medical terms during the consultation process at the Wami Jaya Health Center, Nabire Regency. From analyzing detailed interviews with 8 patients who have elementary to secondary education, we found four main issues: (1) lack of understanding of medical terms, (2) not actively participating in communication, (3) differences in language between doctors and patients, and (4) written educational materials that are not helpful.

Ignorance of Technical Medical Terms

The majority of patients stated that they did not understand medical terms such as "dyspepsia," "lipid profile," "hypertrophy," and "fasting blood sugar," but still agreed as if they understood. One quote stated:

"*The doctor said I had dyspepsia. I thought it was a common ulcer, but I didn't ask because I was afraid it would take too long*."

This shows that some patients interpret foreign terms with their meaning or allow themselves to be in a state of ignorance. This is in line with Sørensen et al. (2015), who emphasized that health literacy includes the ability to understand verbal and written information in a health context. Ignorance of medical terms results in misunderstanding of diagnoses and treatment instructions.

Patient Passivity in Communication

Patients tend not to actively ask questions, even when they do not understand the doctor's explanation. Fear of being considered stupid or not wanting to bother medical personnel are the main reasons for their passive behavior.

"*I just say yes even though I'm confused, rather than being asked many questions*."

This passivity reflects the unbalanced power relations in medical communication. de Vasconcelos et al. (2019) noted that the one-way communication model still dominates primary health care in Indonesia, causing patients to feel they have no room to express their ignorance. From a pragmatic perspective, the result is a failure of Grice's cooperative principle, where the exchange of information occurs formally, but the meaning is not fully transmitted or understood.

Language Inequalities between Doctors and Patients

Patients complained that doctors used fast and technical language without adapting to more general terms. One patient said:

"*When the doctor talks, I get confused quickly... there are many words I've never heard before*."

This indicates the low use of plain language in medical communication. Sahroni et al. (2019) stated that the level of education and income of patients are closely related to their ability to understand technical terminology. Therefore, the use of medical terms that are not contextualized actually widens the communication gap.

The ineffectiveness of Written Educational Materials

Patients also receive educational brochures or leaflets but do not read them because they are considered difficult or irrelevant. Brochures full of medical terms actually make patients reluctant to open or understand their contents.

"*I received a brochure about hypertension, but the words were challenging." I just kept it*."

This assertion is supported by the findings of Anisah et al. (2021), which emphasize the importance of the format, language, and medium of health information. To be optimally accessed and interpreted, educational materials must be adjusted to the reader's literacy profile.

Discussion

This study demonstrates that health education utilizing digital technologies has positively influenced public knowledge of clinical communication. To optimize this potential, collaboration among the government, healthcare providers, and technology developers is essential to guarantee the accessibility, quality, and accuracy of health information that aids the public in comprehending clinical communication in the digital age.

Enhancing access to health information is a primary objective of initiatives aimed at improving public health quality, particularly in developing nations. Reliable, exact, and readily available information can assist individuals in making informed health decisions. One method to enhance this accessibility is by utilizing digital technologies, including the internet, health applications, and online information platforms. Information technology can enhance the accessibility of health services, improve the efficiency of information dissemination, and provide more effective communication between patients and healthcare practitioners. Digital technology can facilitate the surmounting of geographical, linguistic, and human resource obstacles.

This aligns with prior research by Shan et al. (2019), which examines how digital health technologies, including mobile applications and wearable devices, enhance access to health information and promote active community engagement in health management. This study recommends utilizing digital platforms to disseminate health information that is accessible at any time and location, hence diminishing reliance on physical facilities. Additionally, Sørensen (2024) examines studies focused on enhancing health literacy using digital platforms. Health literacy refers to the capacity

to seek, comprehend, and effectively utilize health information, which is crucial for enhancing access to such information. This study's findings demonstrate that digital platforms help mitigate health literacy obstacles by delivering information in a more comprehensible and participatory style. Subsequent research conducted by Petretto et al. (2024) investigates the problems and potential associated with telemedicine and e-health technologies in enhancing access to healthcare services, particularly in regions with a deficiency of medical professionals. The author emphasizes that telemedicine facilitates remote medical consultations and that e-health platforms deliver pertinent health information via mobile devices.

Social media has emerged as a primary tool for communication, information exchange, and global education. In the healthcare sector, social media serves as a very effective conduit for disseminating information, enhancing education, and facilitating health-related behavioral modifications. The utilization of social media in health education is gaining significance due to its capacity to engage a broader audience at less expense. Social media plays a crucial role in health education by facilitating the swift and extensive distribution of health information. Platforms like Twitter, Instagram, and YouTube enable individuals, medical experts, and health organizations to disseminate health recommendations, recent research papers, and health campaigns that enhance public awareness of health issues.

This aligns with prior research by Melchior & Oliveira (2022), which examines the utilization of social media in health education efforts and the obstacles encountered in combating misinformation and disinformation proliferating on these platforms. Ghahramani et al. (2022), this study examines the efficacy of health initiatives conducted via social media, assessing the most impactful content categories and their influence on public behavior and awareness. Durowaye et al. (2022) presents a case study on the utilization of social media during the COVID-19 pandemic to facilitate vaccination and preventative initiatives. The study's results demonstrate that social media significantly contributes to the global dissemination of public health information.

Moreover, educational institutions significantly influence individual attitudes and behaviors, particularly in enhancing public knowledge of diverse issues, including social, environmental, health, and human rights matters. Formal education, from early childhood to college, establishes a robust foundation for the knowledge, abilities, and attitudes that students will utilize throughout their lives. Consequently, education is not merely responsible for imparting knowledge; it also serves as a catalyst for societal change, fostering awareness of significant issues that impact individuals' lives.

This study, along with prior research (Lin, 2013), investigates the role of schools in enhancing the academic community's knowledge of social and political issues and in cultivating students' character to foster responsible citizenship. Tyagi et al. (2021) emphasizes the significance of educational institutions in cultivating students' social consciousness regarding global challenges, including poverty, gender inequity, and prejudice, via socially oriented educational initiatives.

Educational institutions significantly contribute to promoting understanding of several societal challenges, including social awareness, health, environmental concerns,

and legal matters. Integrating these concerns into the curriculum and school activities can significantly contribute to cultivating a generation that is more compassionate, sensitive, and accountable for current world difficulties. To accomplish this, collaboration among multiple stakeholders, including the government, educational institutions, and the community, is essential.

Overall, this study shows that the health literacy crisis at the primary care level is not only triggered by low patient education but also by a lack of language adaptation by medical personnel and empathetic communication models. When doctors do not simplify terms or provide space for patients to ask questions, medical information becomes meaningless.

In the context of the Wami Jaya Health Center, where most patients come from lower middle school educational backgrounds, this challenge is even more complex. Training is needed for medical personnel in the use of effective communication based on patient-centered care, as well as the development of educational materials that are visual, simple, and contextual, such as those successfully implemented through social media in the study of Anisah et al. (2021).

4. CONCLUSION

The research findings indicate that health education in the digital age plays a crucial role in enhancing public knowledge of clinical communication. The government and health organizations can optimize digital media to distribute precise and pertinent health information. Health advertising via platforms like Instagram, YouTube, and health applications can effectively engage a broader audience, particularly among the youth. It is essential to create health applications that are user-friendly, offer valuable information, and have interactive aspects that motivate users to adopt and maintain a healthy lifestyle. Additional initiatives are required to enhance the community's digital literacy, particularly in verifying the sources of health information obtained. Social media users require training or direction on how to discern and assess genuinely reliable content. The government and health organizations might engage with digital platforms to disseminate verified and credible health information. Health education should be an essential component of the educational curriculum across all levels, from elementary school to higher education. Educational institutions might partner with healthcare professionals or organizations to offer seminars or direct training on the significance of health and clinical communication. Cooperation among government entities, educational institutions, and technology firms can enhance digital health education. The government can formulate rules that promote the utilization of technology in health education, while technology firms can innovate to develop health apps that are more beneficial to the community.

This study demonstrates that the health literacy crisis poses a significant barrier to clinical communication strategies in primary care. Individuals with minimal educational attainment and restricted access to health information encounter considerable uncertainty over the medical terminology employed by healthcare professionals. This ignorance manifests not just in spoken communication during consultations but also in written teaching

materials, such as health pamphlets. This study revealed four significant aspects. Lack of familiarity with medical terminology employed by physicians, Patients often hesitate to seek clarification on misunderstood phrases because they fear embarrassment. There is a linguistic disparity between physicians and patients caused by the use of complex medical terminology without simplification, along with ineffective written teaching resources that do not match the patient's reading level.

The health literacy crisis is not merely an individual cognitive issue but also a systemic obligation that encompasses the communication methods of medical workers, the quality of educational resources, and the approach to health care employed. Enhancing health literacy necessitates collaboration among public education, communication training for healthcare professionals, and the availability of accessible and comprehensible informational resources.

REFERENCES

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of Medicine, Surgery, and Public Health*, *2*, 100051. https://doi.org/10.1016/j.glmedi.2024.100051

Anisah, N., Sartika, M., & Kurniawan, H. (2021). Penggunaan media sosial Instagram dalam meningkatkan literasi kesehatan pada mahasiswa. *Jurnal Peurawi: Media Kajian Komunikasi Islam*, *4*(2), 94-112. https://doi.org/10.22373/jp.v4i2.11080

Anwar, R. K., Khadijah, U. L. S., & Rizal, E. (2023). Instagram and Digital Media Literacy among Teenagers in Bandung. *Communicatus: Jurnal Ilmu Komunikasi*, *7*(2), 123-142. https://doi.org/10.15575/cjik.v7i2.23640

Baumeister, A., Chakraverty, D., Aldin, A., Seven, Ü. S., Skoetz, N., Kalbe, E., & Woopen, C. (2021). "The system has to be health literate, too"-perspectives among healthcare professionals on health literacy in transcultural treatment settings. *BMC Health Services Research*, *21*, 1-16. https://doi.org/10.1186/s12913-021-06614-x

Boulos, M. N. K., Hetherington, L., & Wheeler, S. (2007). Second Life: an overview of the potential of 3-D virtual worlds in medical and health education. *Health Information & Libraries Journal*, *24*(4), 233-245. https://doi.org/10.1111/j.1471-1842.2007.00733.x

Brach, C., & Harris, L. M. (2021). Healthy people 2030 health literacy definition tells organizations: make information and services easy to find, understand, and use. *Journal of general internal medicine*, *36*(4), 1084-1085. https://doi.org/10.1007/s11606-020-06384-y

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Dąbrowska, J., Almpanopoulou, A., Brem, A., Chesbrough, H., Cucino, V., Di Minin, A., ... & Ritala, P. (2022). Digital transformation, for better or worse: a critical multi-level research agenda. *R&D Management*, *52*(5), 930-954. https://doi.org/10.1111/radm.12531

de Vasconcelos, P. F., de Freitas, C. H. A., Jorge, M. S. B., de Carvalho, R. E. F., de Sousa Freire, V. E. C., de Araújo, M. F. M., ... & Oliveira, A. C. S. (2019). Safety attributes in primary care: understanding the needs of patients, health professionals, and managers. *Public health*, *171*, 31-40. https://doi.org/10.1016/j.puhe.2019.03.021

Durowaye, T. D., Rice, A. R., Konkle, A. T., & Phillips, K. P. (2022). Public health perinatal promotion during COVID-19 pandemic: a social media analysis. *BMC public health*, *22*(1), 895. https://doi.org/10.1186/s12889-022-13324-4

Easton, P., Entwistle, V. A., & Williams, B. (2013). How the stigma of low literacy can impair patient-professional spoken interactions and affect health: insights from a qualitative investigation. *BMC health services research*, *13*, 1-12. https://doi.org/10.1186/1472-6963-13-319

Ghahramani, A., de Courten, M., & Prokofieva, M. (2022). The potential of social media in health promotion beyond creating awareness: an integrative review. *BMC public health*, *22*(1), 2402. https://doi.org/10.1186/s12889-022-14885-0

Hannawa, A. F., Wu, A. W., Kolyada, A., Potemkina, A., & Donaldson, L. J. (2022). The aspects of healthcare quality that are important to health professionals and patients: A qualitative study. *Patient education and counseling*, *105*(6), 1561-1570. https://doi.org/10.1016/j.pec.2021.10.016

Hasibuan, A. R., Pasaribu, A. F., Alfiyah, S., Utami, J. N., & Harahap, N. R. Y. (2024). Peran Pendidikan Kesehatan dalam Meningkatkan Kesadaran Masyarakat Terhadap Pola Hidup Sehat di Era Digital. *Didaktika: Jurnal Kependidikan*, *13*(001 Des), 305-318. https://doi.org/10.58230/27454312.1515

Li, C., Liu, M., Zhou, J., Zhang, M., Liu, H., Wu, Y., ... & Deng, T. (2022). Do health information sources influence health literacy among older adults: a cross-sectional study in the urban areas of western China. *International journal of environmental research and public health*, *19*(20), 13106. https://doi.org/10.3390/ijerph192013106

Lin, A. (2013). Citizenship education in American schools and its role in developing civic engagement: a review of the research. *Educational Review*, *67*(1), 35–63. https://doi.org/10.1080/00131911.2013.813440

Mazzi, M. A., Rimondini, M., Deveugele, M., Zimmermann, C., Moretti, F., Van Vliet, L., ... & Bensing, J. (2015). What do people appreciate in physicians' communication? An international study with focus groups using videotaped medical consultations. *Health Expectations*, *18*(5), 1215-1226. https://doi.org/10.1111/hex.12097

Melchior, C., & Oliveira, M. (2022). Health-related fake news on social media platforms: A systematic literature review. *New Media & Society*, *24*(6), 1500-1522. https://doi.org/10.1177/14614448211038762

Nutbeam, D. (2019). Health education and health promotion revisited. *Health Education Journal*, *78*(6), 705-709. https://doi.org/10.1177/0017896918770215

Patel, V. L., Yoskowitz, N. A., Arocha, J. F., & Shortliffe, E. H. (2009). Cognitive and learning sciences in biomedical and health instructional design: A review with lessons for biomedical informatics education. *Journal of biomedical informatics*, *42*(1), 176-197. https://doi.org/10.1016/j.jbi.2008.12.002

Paul, J., Ueno, A., Dennis, C., Alamanos, E., Curtis, L., Foroudi, P., ... & Wirtz, J. (2024). Digital transformation: A multidisciplinary perspective and future research agenda. *International Journal of Consumer Studies*, *48*(2), e13015. https://doi.org/10.1111/ijcs.13015

Pawlikowska, T., Zhang, W., Griffiths, F., Van Dalen, J., & van der Vleuten, C. (2012). Verbal and non-verbal behavior of doctors and patients in primary care consultations–How this relates to patient enablement. *Patient education and counseling*, *86*(1), 70-76. https://doi.org/10.1016/j.pec.2011.04.019

Petretto, D. R., Carrogu, G. P., Gaviano, L., Berti, R., Pinna, M., Petretto, A. D., & Pili, R. (2024). Telemedicine, e-health, and digital health equity: a scoping review. *Clinical practice and epidemiology in mental health: CP & EMH*, *20*, e17450179279732. https://doi.org/10.2174/0117450179279732231211110248

Sahroni, S., Anshari, D., & Krianto, T. (2019). Social Determinants of the Level of Health Literacy in Hypertension Patients in the Public Health Center of the Cilegon City. *Faletehan Health Journal*, *6*(3), 111-117. https://doi.org/10.33746/fhj.v6i3.94

Sætra, H. S., & Fosch-Villaronga, E. (2021). Healthcare digitalisation and the changing nature of work and society. In *Healthcare* (Vol. 9, No. 8, p. 1007). MDPI. https://doi.org/10.3390/healthcare9081007

Seibert, R. G., Winter, M. R., Cabral, H. J., Wolf, M. S., Curtis, L. M., & Paasche-Orlow, M. K. (2019). Health literacy and income mediate racial/ethnic asthma disparities. *HLRP: Health Literacy Research and Practice*, *3*(1), e9-e18. https://doi.org/10.3928/24748307-20181113-01

Shan, R., Sarkar, S., & Martin, S. S. (2019). Digital health technology and mobile devices for the management of diabetes mellitus: state of the art. *Diabetologia*, *62*(6), 877-887. https://doi.org/10.1007/s00125-019-4864-7

Sharma, M. (2021). *Theoretical foundations of health education and health promotion*. Jones & Bartlett Learning.

Sørensen, K. (2024). Fostering digital health literacy to enhance trust and improve health outcomes. *Computer Methods and Programs in Biomedicine Update*, *5*, 100140. https://doi.org/10.1016/j.cmpbup.2024.100140

Sørensen, K., Pelikan, J. M., Röthlin, F., Ganahl, K., Slonska, Z., Doyle, G., ... & Brand, H. (2015). Health literacy in Europe: Comparative results of the European Health Literacy Survey (HLS-EU). *European Journal of Public Health*, 25(6), 1053–1058. https://doi.org/10.1093/eurpub/ckv043

Stellefson, M., Paige, S. R., Chaney, B. H., & Chaney, J. D. (2020). Evolving role of social media in health promotion: updated responsibilities for health education specialists. *International journal of environmental research and public health*, *17*(4), 1153. https://doi.org/10.3390/ijerph17041153

Stoumpos, A. I., Kitsios, F., & Talias, M. A. (2023). Digital transformation in healthcare: technology acceptance and its applications. *International journal of environmental research and public health*, *20*(4), 3407. https://doi.org/10.3390/ijerph20043407

Taba, M., Allen, T. B., Caldwell, P. H., Skinner, S. R., Kang, M., McCaffery, K., & Scott, K. M. (2022). Adolescents' self-efficacy and digital health literacy: a cross-sectional mixed methods study. *BMC Public Health*, *22*(1), 1223. https://doi.org/10.1186/s12889-022-13599-7

Taylan, C., & Weber, L. T. (2023). "Don't let me be misunderstood": communication with patients from a different cultural background. *Pediatric Nephrology*, *38*(3), 643-649. https://doi.org/10.1007/s00467-022-05573-7

Tyagi, R., Vishwakarma, S., Rishi, M., & Rajiah, S. (2021). Reducing inequalities through education and skill development courses. In *Reduced Inequalities* (pp. 746-758). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-95882-8_102