International Archives of Medical Sciences & Public Health
E-ISSN : 2798-5172; P-ISSN : 2798-5276X
Volume 7, Number 1, 2026
DOI: 10.53806/iamsph.v7i1.1436
Page: 15–27

LIVED EXPERIENCES OF HEALTH INFORMATION PROCESSING AMONG TYPE 2 DIABETES MELLITUS PATIENTS IN BANDUNG CITY: A PHENOMENOLOGICAL STUDY

Olih Solihin[1], **Safutra Rantona**[2], **Rina Sovianti**[3], **Rio Kurniawan**[4]
[1,2]Commucation Science Department, Universitas Komputer, Indonesia
[3]Communication Science Department, Universitas Bunda Mulia, Indonesia
[4]Communication Science Department, Universitas Trunodjoyo, Indonesia

Article Info

Article history:
Received : March 14, 2026
Revised : April 17, 2026
Accepted : May 15, 2026

Keywords:
Bandung City;
Diabetes Mellitus;
Health Communication;
Health Literacy;
Phenomenology.

ABSTRACT

Health literacy plays an essential role in effective self-management of type 2 diabetes mellitus (T2DM). There is insufficient research in the qualitative literature on health information processing among Indonesian urban populations seeking primary healthcare. This exploratory phenomenological study aimed to explore the lived experience of seven adults with T2DM in Bandung, Indonesia, in relation to health information processing and barriers to understanding. The data were collected via in-depth interviews (December 2025-January 2026) and analyzed using reflexive thematic analysis. Considering the sample size of seven individuals purposefully selected, the results can be considered preliminary and non-generalizable. Four main themes arose from the analysis: (1) varied sources of health information and variable abilities to evaluate health information sources; (2) comprehension barriers due to technical medical language without sufficient context; (3) barriers to patient-health worker communication because of structural, linguistic, and cultural factors; and (4) various influences of digital media and peer socialization on health behavior. It was identified that health literacy is a continuum process, which depends not only on personal characteristics of patients but also on the communicative setting of medical consultations. Recommended actions for addressing the problem include health workers' training on patient-centered communication (e.g., teach-back technique), development of online resources

Corresponding Author:
Olih Solihin,
Communication Science Department,
Universitas Komputer, Indonesia
Email: olih.solihin@email.unikom.ac.id

1. INTRODUCTION

The type 2 diabetes mellitus disease is one of the most serious threats that Indonesia faces today. The problem is apparent in the city of Bandung, located in West Java Province. As stated in statistics released by the West Java Provincial Health Office, the yearly incidences of diabetes in Bandung city were steady between 41,000 and 45,000 cases during the years of 2019-2024 [1]. Although the stable trend could indicate advancements in disease monitoring and management, it also demonstrates the continued prevalence of T2DM in the community and the ongoing need for patients' education and self-management [2], [3].

On the international stage, [4] demonstrated that in 2021, the prevalence rate of diabetes among people aged between 20 and 79 in the world was 10.5%, which is equal to 536.6 million patients, while projections showed that it will increase to 12.2% or 783.2 million patients in 2045, and most of them will be in Southeast Asia. Health literacy in Indonesia is further complicated by the evident gaps in health literacy levels in various socio-economic and geographic areas. As defined as the ability to acquire, understand, and use health-related information in decision making, health literacy has been shown to correlate with better compliance and self-management of illness [5], [6].

Though there is already a lot of literature regarding epidemiological and treatment aspects of diabetes mellitus in Indonesia, there are few studies that explore the relationship between patients' understanding of health-related information as part of their everyday medical encounter experiences. Literature in Indonesia on the issue of health literacy among urban patients who have T2DM tends to make use of quantitative techniques in measuring information gathering skills. While such techniques are certainly useful, they do not attempt to explain the interpretation of information gathering and communication [7] [8].

Systematic reviews on health communication studies conducted in Southeast Asia have shown that there should be more studies investigating the subjective experiences of patients and culturally based health communication practices [6, 10]. These are especially relevant in the case of Bandung, where there have been six consecutive years with an increased prevalence rate of T2DM [9].

This study will investigate the following research questions: (1) How do adult patients diagnosed with T2DM in Bandung City interpret the health information disseminated to them by health professionals? (2) What are the barriers that define the interaction between patients and health workers regarding structural, linguistic, and cultural factors? (3) To what extent does technology utilization and social networks affect the management of health information?

1.1 Theoretical And Conceptual Framework

The current study was supported by two theoretical approaches that were applied in the formulation of the guide and in coding the data. These include Nutbeam's classification of three-level health literacy [10], which refers to the following: Functional Health Literacy (the capacity to read and interpret health-related messages), Communicative Health Literacy (the capacity to obtain and use information in various contexts), and Critical Health Literacy (the capacity to critically evaluate the information and be autonomous in decision-making processes) [11]. The three dimensions have been utilized in the deductive coding scheme employed in the analysis of the data collected [12].

The second framework is the Health Belief Model (HBM) [13]. Instead of using the entire HBM framework, the study focused on operationalizing the "perceived barriers" concept, which is comprised of psychological, social, and cultural barriers that inhibit people from accessing health information and sharing their health practices with health professionals [14]. The interview questions about self-censorship, reluctance in communicating, and withholding complementary medicine usage information were directly derived from this construct. In this context, Nutbeam's conceptual framework and the HBM perceived barriers concept offered different but complimentary ways of analyzing patients' use of health information [15], [16].

2. RESEARCH METHOD

2.1 Research Design and Phenomenological Approach

The study involved a qualitative research design, which was based on the descriptive phenomenology philosophy. Descriptive phenomenology philosophy entails the use of the method known as époché. The process involves the suspension of previous assumptions in order for the researcher to reach the basic structures of consciousness [17]. Descriptive phenomenology was chosen for the study since the objective was to capture the first-person perspective of the patient experience [18] [19].

However, it should be noted that the use of reflexive thematic analysis according to Braun and Clarke [20] as the chosen analytical technique implies the presence of an interpretive dimension, which may conflict with a pure Husserlian description [21] [22]. Since époché emphasizes the need for a direct description of the essence, in the case of reflexive thematic analysis, one deals with meaning-building [23]. Taking this into account, it should be mentioned that the current study might be seen as an intermediate stage between descriptive and interpretive phenomenology, with the process of data gathering conducted based on the principles of descriptive phenomenology (that is, emphasis was put on participants' descriptions, and minimal interpretation was made by the researcher), whereas analysis was performed using the technique of reflexive thematic analysis [24] [25].

In order to maintain rigour throughout both stages, the research group kept reflexive journals of their preconceptions, professional orientation, and any biases prior to the data collection stage. Bracketing was kept intact by the use of analytical memos after each interview and peer debriefing after each coding session [26]. All interpretive processes were accounted for in an audit trail [27] [28].

2.2 Participants

The participants in this study were purposively chosen based on the following criteria: having a diagnosis of T2DM for at least one year; residing in the city of Bandung; obtaining health education from a medical professional; and giving their informed consent. Seven participants fulfilled all criteria and went through the entire study process. Small sample sizes are typical of phenomenological research, where five to twenty-five participants are enough to explore a complicated phenomenon [29]. Therefore, the sample size in this research is appropriate because it is solely explorative in nature [30].

Thematic saturation was analyzed using two complementary approaches [31]. Firstly, independent coding done by two researchers showed that no additional codes appeared after the sixth interview, while the seventh interview acted as a confirmation step. Secondly, the research team agreed that there was enough variation in the experience of the participants to conduct thematic saturation [32]. Although the concept of thematic saturation in small qualitative sample sizes is interpretive rather than technical, systematic methods have always been applied in this manner [33].

Sociodemographic and clinical data of the respondents can be found in Table 1 [34]. The study sample was collected by using purposive sampling technique, wherein individuals were selected based on their availability at two primary healthcare facilities in Bandung city, namely Puskesmas Sukajadi and a private community health facility. No socioeconomic selection criterion was used, although occupational heterogeneity of study participants—encompassing civil servant and private employee, trader, retired person, and housewife is representative of different socioeconomic strata [35].

Table 1: Sociodemographic and Clinical Characteristics of Participants with Type 2 Diabetes Mellitus in Bandung and West Java

ID	**Initials**	**Age**	**Gender**	**Occupation**	**Diabetes Status**	**Initial Detection / Diagnosis**	**Risk Factor**
I1	R.Z	52	Male	Lecturer	Controlled (since 2025)	Fell ill during Umrah pilgrimage in 2024; blood glucose around 400 mg/dL	Family history (mother & sibling)
I2	N.A	48	Female	Housewife	Controlled	Formal clinical diagnosis following persistent symptoms	Dietary habits
I3	S.R	45	Female	Teacher	Controlled	Clinical diagnosis after persistent numbness and slow wound healing	Lifestyle
I4	D.M	50	Female	Trader	Controlled	Near-fainting episode while working	Dietary habits
I5	L.P	43	Female	Private sector employee	Controlled	Medical diagnosis after fatigue and blurred vision	Lifestyle

ID	Initials	Age	Gender	Occupation	Diabetes Status	Initial Detection / Diagnosis	Risk Factor
I6	R.K	55	Female	Retiree	Controlled	Detected via routine family history screening	Hereditary
I7	A.F	47	Male	Entrepreneur	Controlled	Asymptomatic; found during annual medical check-up	Lifestyle

2.3 Data Collection

Data collection was performed by conducting semi-structured, in-depth interviews between December 2025 and January 2026, with each interview lasting from 45 to 90 minutes. Interviews were conducted in-person or through video calls depending on the preference of the respondents. All interviews were conducted in Indonesian, as all researchers had sufficient proficiency in the Indonesian and Sundanese languages [36].

The interview guide focused on four thematic areas based on the theoretical underpinnings. Thematic areas included sources of health information; understanding of medical language; experience of communication with health practitioners; and interaction with digital media and social networking sites. The guide was organized as follows: Block 1 was about health information sources (for example, “Where do you normally get information about your diabetic condition?”); Block 2 focused on understanding health care communication (for instance, “Are there any words or explanations used by your doctor that you cannot comprehend?”); Block 3 related to the obstacles in patient-doctor communication (for example, “Do you feel confident enough to raise some questions or concerns during your visit?”); and Block 4 related to using digital media and social networks (for instance, “Do you use the Internet, social networking sites or instant messengers to get information on your health issue, and what criteria do you use to assess its reliability?”) [37]. The full interview guide can be provided to interested parties upon request. Every interview began with an open-ended prompt before moving on to probing questions about particular topics. The inclusion of digital media in this research was prearranged based on relevant literature [38].

All participants provided written informed consent before being interviewed. Participants were clearly told that they had an absolute right to withdraw from the study at any point without suffering any repercussions. Audio taping was done only with the written consent of the participant. Transcriptions of interviews were made verbatim by the lead investigator from audio tapes; fieldnotes and memos were prepared after each interview. Pre-testing of the interview guide was done with two T2DM patients who did not belong to the final sample” [39].

2.4 Data Analysis

The transcriptions were analyzed using NVivo 12. The reflexive thematic analysis process proposed by Braun and Clarke [8] consisting of six stages was used in this research: data familiarization, coding, generating themes, reviewing themes, defining and naming themes, and reporting findings. Two researchers coded all the transcriptions independently; disputes between the coders were settled through discussions and, if necessary, through mediation by a third researcher.

Member checking was done by giving the participants summaries of the themes identified along with appropriate quotations. Participants were given one week to look through their summaries. Five out of seven accepted their summaries while two requested clarifications.

2.5 Ethical Considerations

All the above aspects of ethics relating to voluntary participation, obtaining informed consent, data confidentiality, and the anonymity of the participants were strictly followed while conducting the research. The procedure used for obtaining consent is elaborated in Section 2.3, and it is explicitly mentioned there that the participants had the freedom to quit the research process at any point in time. The confidentiality of the participants is ensured by coding their initials. All audio recordings and transcriptions are stored in encrypted computers for five years.

2.6 Trustworthiness

Validity was checked in terms of the four criteria proposed by Lincoln and Guba [15]. Credibility was ensured through member checks and source triangulation from interviews, field notes, and observation memos. Audit trails that include coding records, NVivo 12 project files, and analytical choices made are provided to ensure dependability. Confirmability was achieved through reflexive journal writing, double coding by two independent researchers, and discussion to reach a consensus on the analysis performed. Thick description of participants' qualities and quotations can be taken as support for transferability.

2.7 Researcher Reflexivity

The research team includes scholars of communication who have professional experience in the fields of health communication and media studies. The lack of any kind of clinical training helped avoid the application of a biomedical interpretative framework for analysing participants' perspectives. Of the four researchers involved in the study, three have prior experience of doing qualitative research among patients of West Java. This allowed them to be aware about the cultural context and language of participants but also exposed them to a risk of bias.

This issue was addressed via reflexive journaling, which is explained in section 2.1 below. Power imbalance between researcher and participant was overcome through voluntary participation and option to withdraw.

3. RESULT AND ANALYSIS

Thematic analysis of the seven interview transcripts yielded four themes that were consistently present in the corpus of data. These were (1) the diverse and multi-modal character of sources of health information; (2) challenges in understanding medical language and communication; (3) barriers to effective patient-health worker communication; and (4) the dual and often conflicting role of the Internet and social networks in shaping health behaviors. The four themes are described in greater detail below through illustrative quotes from the interviews, and considered in light of the underlying experiential structures involved in each case - namely, ways that subjects coped with uncertainty, established trust, and wielded or surrendered agency within the healthcare system.

3.1 Sources and Reliability of Health Information

All the participants stated that their first contact with information regarding diabetes was via doctors at a Puskesmas or a private clinic [39]." Nevertheless, there was a unique information-seeking process after their first contact. Most participants felt that information provided during the clinical visits was not enough, leading them to search for information from digital resources, peers, family members, etc. Reasons differed from one participant to another, such as the feeling that their queries were not answered in the visit or being confused about the disease diagnosis.

However, no matter what, clinical visits were always the trigger for searching for additional information. Different information sources used were based on personal choices, education, and digital knowledge. R.Z (I1) is an example of one of the most active information-seekers.

He mentioned his use of YouTube videos and health-related websites, saying that the use of digital media gave him a sense of control over the intake of information, which was not possible at the clinic level [23]. He said, "There really is no time during my visit to the clinic—everything the doctor says needs to be processed very fast. But when I sit at home and watch videos on YouTube, I can stop, rewind, think, and understand. That does not mean I am replacing the doctor; that is my method of understanding what the doctor said" (R.Z, I1, personal communication, February 2026, translated from Indonesian).

N.A (I2) and L.P (I5) joined WhatsApp groups among other T2DM patients, appreciating both the informational aspect as well as socialization [25]. N.A expressed her appreciation of the WhatsApp group, which offered an added benefit beyond clinical consultation: "WhatsApp helps us exchange experiences regarding our diet. It is as if we have friends who understand us very well a thing doctors cannot always do" (N.A, I2, personal communication, February 2026, translated from Indonesian).

A.F (I7) distinguished between motivationally-oriented content and medical content on social media sites, confining clinical questions to in-person visits [29]. In each of these instances, however, the digital medium was not used as a substitute for clinical interaction; rather, it served as the additional medium through which individuals were able to regain some form of coherence and efficacy after their illness diagnosis [18].

From a phenomenological perspective, what is true about each of these stories is that they all reveal an experience of epistemic uncertainty, or an experience in which the patient knows his diagnosis but lacks the proper tools by which to understand that diagnosis. The search for several kinds of information is thus not so much an effort to distrust the clinical system but rather a way of filling in the gap of knowledge and understanding that comes with knowing one's diagnosis.

There was a large variance among participants' ability to evaluate information. Participants R.Z and S.R (I3), who had attained a higher level of education, performed systematic source checking, showed doubt about commercialized information, and evaluated credibility based on source congruence [27]. D.M (I4) and R.K (I6) relied heavily on information obtained from external sources without subjecting it to critical analysis [25]. The aforementioned variance is aligned perfectly with Nutbeam's three types of health literacy [6]. As illustrated in Table 2, participants classified as High in critical health literacy performed systematic source checking; participants classified as Moderate in critical health literacy selectively evaluated sources; and participants classified as Low in critical health literacy accepted information without questioning its origin.

Table 2: Health Literacy Levels by Informant

Initial	**Functional Literacy**	**Communicative Literacy**	**Critical Literacy**
R.Z	Able to read and understand basic medical info	Adapts information to daily diet decisions	High: actively cross-checks online and clinical sources
N.A	Understands basic dietary restrictions	Applies doctor's advice to meal planning	Moderate: trusts close sources more than unknown ones
S.R	Good comprehension of general DM info	Uses info to modify exercise and food choices	High: evaluates credibility of sources systematically
D.M	Basic functional understanding	Limited application beyond diet reduction	Low: rarely questions information received
L.P	Good; actively reads about DM	Applies sleep and dietary guidance consistently	Moderate: uses multiple digital sources selectively
R.K	Relies primarily on doctor's advice	Applies medication schedule consistently	Low: accepts information without questioning
A.F	Good; proactive about check-ups	Integrates lifestyle info from digital media	Moderate: deliberately separates motivational from medical content

Ratings derived through consensus coding against Nutbeam's [6] three-tier health literacy framework. Verified during member checking. Source: NVivo 12 thematic coding, 2026

3.2 Comprehension of Medical Terminology

Language problems in healthcare formed a major theme throughout the interviews. Such words as HbA1c, neuropathy, and insulin resistance were used frequently by healthcare professionals in the interviews without any additional explanations provided to the patient. The usual response was performative comprehension maintaining eye contact, nodding and pretending to understand, although not out of deceit, but rather because of communication difficulties, which were considered normal in that situation [10].

There were diverse ways patients coped with their inability to understand the information presented to them. D.M (I4) transcribed difficult-to-pronounce words and asked her daughter to find an explanation of those words afterwards. Still, she did not know the meaning of those words in the context of her diabetes: "Why is it important for me?" (D.M, I4, personal communication, February 2026, my translation from Indonesian) This means that patients did not integrate the acquired knowledge into their lives [33]. On the other hand, R.K (I6) memorised her medication routine without having any idea why it is necessary physiologically [34].

In terms of phenomenology, the commonality between the two experiences lies in the experience of being in the position of the recipient rather than a participant within the communication process. This was not perceived as a neutral aspect of the process but as a restriction of patient autonomy. This can be correlated with the claims of Paasche-Orlow and Wolf [9], who state that health literacy is not an inherent characteristic of the patient but rather emerges from the interaction between patient resources and the communication context created by the healthcare system.

3.3 Communication Barriers with Health Workers

Three dimensions were involved in creating barriers between participants and healthcare workers. Time was one of the most common structural limitations. Visits to Puskesmas clinics involved considerable time constraint, and this had nothing to do with the attitude of practitioners but rather with some features of urban primary health care, including high patient flow and short visit duration [4]. This created conditions that forced participants to adopt a self-limiting approach: “I write down what questions I want to ask ahead of time; but once I get there and see how many people are waiting, I think I shouldn’t waste too much time on myself. Therefore, sometimes I don’t have enough courage to ask all the questions and just go home” (N.A, I2, personal communication, February 2026, translated from Indonesian).

Language and register were the second set of barriers examined. Several participants talked about instances where clinical information was presented in technically correct but unintelligible language [19]. Other participants highlighted examples of very memorable and effective communication; for instance, L.P (I5) spoke about a nurse’s use of the lock and key analogy to explain the process of insulin action— “The nurse said that insulin works like a key and the cell like the lock, and unless you have the key the sugar remains in your bloodstream” (L.P, I5, personal communication, February 2026, translated from Indonesian). This approach proved much more effective compared to anything else she had read before. The importance of using an analogical explanation is not that it makes clinical concepts simpler, but rather that it offers cognitive scaffolding through which the information can be independently processed [32].

Cultural factors contributed another dimension to this complex phenomenon. D.M (I4) revealed that she had also been administering herbal supplements along with her prescription medication during multiple appointments but without alerting her doctor. She was conscious of this secrecy, finding it difficult to bear, but the expected discomfort of telling – namely, the fear of being judged and jeopardizing the relationship – was enough to deter disclosure [10]. This tendency towards non-disclosure has been repeatedly reported in Indonesia and Southeast Asian health communication studies, where the culture’s emphasis on relational harmony and respect for authority makes patient objection, skepticism, or rebuttal highly socially costly [10], [30]. Such an instance precisely exemplifies the perceived barriers element of the HBM [28] in that psychological and sociological determinants hinder health behavior regardless of information availability.

Figure 1 illustrates the thematic representation of communication barriers subcategories among the participants, as analyzed in NVivo 12. Frequency refers to the count of participants who have exhibited such a category in their interview transcripts based on independent double coding.

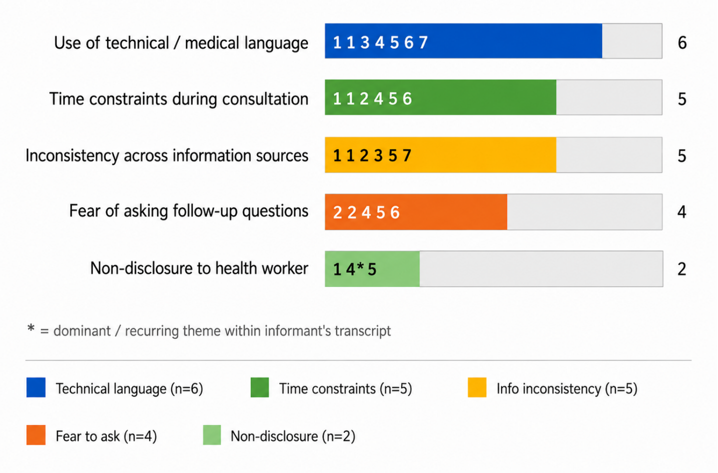

Figure 1: Distribution of Communication Barrier Sub-themes Across Informants (NVivo 12 Node Frequency

3.4 Digital Media and Social Support

The use of digital media by the seven participants showed a much more complicated picture compared to just being helpful or unhelpful in the process of diabetes care. While most of the participants relied upon digital media to complement their clinical data, the difference lay in the extent to which the information found online was relevant and critical in nature [5]. The participant R.Z (I1) was very active in her use of digital media and relied mostly on clinical videos posted by clinicians on YouTube to validate their credibility [24]. Another participant S.R (I3) used health apps and websites to monitor her dietary intake and identify suitable substitutes for sugar [21].

D.M (I4) is the lone respondent who characterized herself as not being a user of digital health media due to the structural limitations involved: “I do as the doctor says” (D.M, I4, personal communication, February 2026, translated from Indonesian). The above example illustrates another aspect of digital health inequality that exists apart from health literacy – that is, the unequal access and navigation of digital tools as sources for health-related information [18]. Digital media were utilized by R.K (I6) solely for the purpose of confirming the names of the drugs prescribed by doctors during consultations. N.A (I2) and L.P (I5) were members of WhatsApp-based peer support groups that offered them both informational and emotional advantages from such an engagement.

The issue of misinformation has been brought out in a number of interviews undertaken. Those with high critical health literacy skills like R.Z and S.R mentioned that they were involved in verifying sources and would never believe in any form of false information [27]; while others had no knowledge about the risks involved in misinformation [25]. This disparity bears a clear connection with the various levels outlined by Nutbeam [6] and it also serves to confirm an important aspect highlighted in other research studies on digital health communication and internet use in accessing health information [18].

Table 3: Digital Media Use by Informants

Initial	**Main Platform**	**Purpose of Use**	**Critical Evaluation**
R.Z	YouTube, health websites	Supplement clinical info; understand medical terms	High: cross-checks sources; prefers clinician-produced content
N.A	WhatsApp patient group	Dietary tips; social support	Moderate: trusts group members selectively
S.R	Health apps, websites	Track meals; find alternatives to sugar	High: evaluates source credibility systematically
D.M	Minimal / none	Not an active digital media user	Low: no digital health information-seeking
L.P	WhatsApp, Instagram	Diet and sleep information	Moderate: uses multiple platforms selectively
R.K	WhatsApp	Verify medication names	Low: accepts content without questioning
A.F	Instagram, YouTube	Exercise routines; lifestyle motivation	Moderate: deliberately separates motivational from medical content

Ratings derived using the same operational criteria as Table 2, based on Nutbeam’s [6] critical health literacy construct.

3.5 Discussion

From the above discussion, it becomes clear that health literacy may be considered as a variable and contextual phenomenon whereby health literacy cannot be considered to be constant or homogenous among the patients suffering from T2DM residing in urban Indonesia. This is because health literacy is dependent upon the interplay between the individual’s competence and the communication factors within the clinical setting.

3.5.1 Interpreting the Themes Against Existing Literature

The observation that all seven participants use more than one information source aligns with larger trends observed in other research within Indonesian and Southeast Asian health communication studies. According to [36], the scattered nature of information about diabetes in the urban Indonesian population was highly uneven depending on socio-economic status – a trend strikingly similar to the disparity observed in this study when evaluating source evaluation skills. On an international scale, health literacy programs have been shown to positively influence both glycaemic control and self-management practices in patients with T2DM [16]. This study offers insight into the phenomenology behind such disparities.

The difficulties in comprehension identified in this paper are in line with those found [19], in which functional health literacy was shown to be a predictor for the quality of physician-patient communication in diabetes care. The current paper takes this one step further by revealing that comprehension failure is the result of a collaboration between the skills of the patient and the methods of communication used by the doctor in brief interactions.

This is in line with the findings of [13] regarding the link between information gap and self-care behavior. The cultural component of communication barrier, for instance, the failure of D.M. to disclose his consumption of herbal medicine, is in line with [10] on unidirectional and paternalistic communication in Southeast Asian clinical environment. This is because of its hierarchical nature and tendency to avoid conflict. In light of the current study findings, such barriers are still prevalent in Bandung's primary health care setting, not only influencing interpersonal relationships but also guiding intrapersonal relationships.

3.5.2 Why Puskesmas Communication Culture Shapes Literacy as a Continuum

An important lesson from this research is that health literacy is not something that either exists or does not exist within patients. The structure of visits to Puskesmas clinics, including time restrictions, large numbers of patients, and existing communication asymmetries, places patients at a disadvantage who lack adequate communicative and critical health literacy. Limited time means creating circumstances under which patients avoid asking questions, simulate understanding where there is none, and leave without fulfilling their needs, having to do it elsewhere. Clinical practice becomes one component that affects functional health literacy [9]. In the HBM approach, the perceived barrier becomes relevant due to structural and cultural factors that reinforce each other in a way that a person who lacks confidence in her ability to ask questions becomes even more restricted after spending many hours waiting for a visit lasting a couple of minutes. This means that there is a situation where people who are able to communicate well benefit automatically. The above claims stem from seven persons who are located in an urban area, hence requiring more investigation.

3.5.3 Addressing Contradictions: Education, Critical Literacy, and Digital Vigilance

Another important theoretical observation has been observed in the relationship between formal education and critical health literacy which turned out to be non-deterministic. Participants with relatively high education, R.Z. and S.R, practiced systematic verification of sources. Indeed, according to [27], there were positive correlations between education and critical information behavior. Yet, the relationship was far from being linear. While A.F possessed critical literacy skills, she used boundaries to differentiate motivational material from medical content; such an application of critical literacy skills appears to have been learned from practice, not education. Some highly educated participants, in contrast, did not exercise critical thinking when consuming credible information via trusted social networks; this implies that trust in social media could play a greater role in their choice. In general, it may be considered an expansion of Nutbeam's classification of communicative and critical health literacy skills [6]. The latter one refers to more complex ability to critically reflect not only on information itself but also on context of its production.

3.5.4 Implications for Health Policy, Primary Care Training, and Digital Health Literacy Interventions

Practical implications of the findings include their relevance to health communication practices and policies in Indonesia, recognizing that the findings are largely exploratory. The structural factors associated with Puskesmas consultations, such as limited time, high number of patients, and communication imbalance, are systemic obstacles that cannot be addressed merely through patient education initiatives [20] [32]. Training programs should include strategies for patient-centered communication, such as analogical explanations, teach-back methods to verify understanding, and encouragement for patients to ask questions even in brief consultations [20], [32].

With regard to digital health communication, the findings reinforce the need for strategies that account for varying levels of digital literacy, as highlighted by Solihin and Abdullah. WhatsApp groups provided both information and social support according to the Social and Behaviour Change Communication framework, and clinician-led groups may be able to provide the same while minimizing misinformation risk. Complementary and alternative medicine non-disclosure is another area for possible intervention, which can be achieved using culturally appropriate modules for patient education programs [10], [30]. Screening tools in Bahasa Indonesia for health literacy can be incorporated into the clinical management of chronic diseases [3].

3.5.5 Methodological Limitations

There are several constraints that need to be noted. To begin with, since this is a purposive sample of just seven respondents, there is low generalizability. That is, the study's results are only applicable to the Bandung respondents interviewed and not to other patients in West Java or Indonesia with T2DM. Secondly, all respondents had controlled diabetes at the time of interviewing and thus perspectives of those with uncontrolled diabetes – and thus likely experiencing difficulties communicating their condition are missing. Thirdly, conducting both face-to-face and video calls might lead to varying disclosure levels. Lastly, despite the use of techniques such as member-checking and reflexive journaling, the social desirability problem cannot be totally avoided.

4. CONCLUSION

The research was undertaken through an exploratory study on how seven adults with T2DM experience the process of engaging with health information while being located in Bandung. There were four key interrelated insights obtained through this study. First, health literacy functions as a continuum influenced by both contextual communication aspects of clinical interaction and patient individual characteristics. Second, time constraints in the structure of primary health care, such as the time limitation in Puskesmas consultation sessions, limit patient communicative autonomy. Third, values regarding relational harmony and deference to authority lead to information hiding and feigned understanding that are not revealed by any aggregate health literacy measures. Fourth, digital media serves as an unofficial extension of primary health care.

The results presented here are exploratory and context-specific. Recommendations are made on three different time frames. On an immediate basis: health worker training with communication skills for the use of teach-back techniques and comprehension checks. On a near-term basis: development of a validated health literacy test in Bahasa Indonesia for chronic disease management, and the creation of patient support groups through clinicians along with culturally-appropriate non-disclosure modules. In the long term: attention at the policy level to barriers resulting from the lack of time in Puskesmas visits.

Since all participants were well-controlled diabetics in an urban environment, future studies should utilize maximum variation sampling based on disease management and geographic diversity within West Java.

REFERENCES

[1] Dinas Kesehatan Provinsi Jawa Barat, “Jumlah penderita diabetes melitus berdasarkan kabupaten/kota di jawa barat,” 2024. [cited 2026 Apr 27]. Available from: `https://opendata.jabarprov.go.id/id/dataset/jumlah-penderita-diabetes-melitus-berdasarkan-kabupatenkota-di-jawa-barat`.

[2] H. Sun, P. Saeedi, S. Karuranga, M. Pinkepank, K. Ogurtsova, and B. B. e. a. Duncan, “Idf diabetes atlas: global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045,” *Diabetes Research and Clinical Practice*, vol. 183, p. 109119, 2022. `https://doi.org/10.1016/j.diabres.2021.109119`.

[3] Kementerian Kesehatan Republik Indonesia, *Profil Kesehatan Indonesia 2023*. Jakarta: Kemenkes RI, 2023.

[4] N. M. Hustrini, E. Susalit, M. van Diepen, and J. I. Rotmans, “Perceived barriers to management of patients with diabetes mellitus and hypertension in primary care centers in indonesia,” *Frontiers in Health Services*, vol. 5, p. 1715125, 2025. `https://doi.org/10.3389/frhs.2025.1715125`.

[5] O. Solihin and A. Z. Abdullah, *Komunikasi Kesehatan Era Digital: Teori dan Praktik*. Jakarta: Prenada Media, 2023.

[6] D. Nutbeam, B. McGill, and P. Premkumar, “Improving health literacy in community populations: a review of progress,” *Health Promotion International*, vol. 33, no. 5, pp. 901–911, 2018. `https://doi.org/10.1093/heapro/dax015`.

[7] J. W. Creswell and C. N. Poth, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks: SAGE, 4 ed., 2016.

[8] V. Braun and V. Clarke, “Reflecting on reflexive thematic analysis,” *Qualitative Research in Sport, Exercise and Health*, vol. 11, no. 4, pp. 589–597, 2019. `https://doi.org/10.1080/2159676X.2019.1628806`.

[9] M. K. Paasche-Orlow and M. S. Wolf, “The causal pathways linking health literacy to health outcomes,” *American Journal of Health Behavior*, vol. 31, no. Suppl 1, pp. S19–S26, 2007. `https://doi.org/10.5993/AJHB.31.s1.4`.

[10] M. Claramita, M. D. F. Nugraheni, J. van Dalen, and C. van der Vleuten, “Doctor–patient communication in southeast asia: a different culture?,” *Advances in Health Sciences Education*, vol. 18, no. 1, pp. 15–31, 2013. `https://doi.org/10.1007/s10459-012-9352-5`.

[11] O. Solihin, D. P. Lubis, P. Muljono, and S. Amanah, “Social and behavior change communication (sbcc) approach in tuberculosis management by terjang foundation,” *Mediator: Jurnal Komunikasi*, vol. 16, no. 1, pp. 1–13, 2023. `https://doi.org/10.29313/mediator.v16i1.2168`.

[12] O. Solihin, Y. Yasundari, and A. Z. e. a. Abdullah, “Social and behavior change communication framework,” *Oxytocin and Social Function*, vol. 10, no. 2, pp. 45–58, 2023.

[13] Y. Sari, A. Isworo, A. S. Upoyo, A. Taufik, R. Setiyani, and K. G. e. a. Swasti, “The differences in health-related quality of life between younger and older adults and its associated factors in patients with type 2 diabetes mellitus in indonesia,” *Health and Quality of Life Outcomes*, vol. 19, no. 1, p. 124, 2021. `https://doi.org/10.1186/s12955-021-01756-2`.

[14] M. H. Algifari, L. Zachary, R. P. Yuliani, H. Aditama, and S. A. Kristina, “Digital health literacy and its associated factors in general population in indonesia,” *Indonesian Journal of Pharmacy*, vol. 35, no. 2, pp. 355–362, 2024. `https://doi.org/10.22146/ijp.5640`.

[15] Y. S. Lincoln and E. G. Guba, *Naturalistic Inquiry*. Beverly Hills: SAGE, 1985.

[16] J. Butayeva, Z. A. Ratan, S. Downie, and H. Hosseinzadeh, “The impact of health literacy interventions on glycemic control and self-management outcomes among type 2 diabetes mellitus: a systematic review,” *Journal of Diabetes*, vol. 15, no. 9, pp. 724–735, 2023. `https://doi.org/10.1111/1753-0407.13436`.

[17] Y. Sun, Y. Zhang, J. Gwizdka, and C. B. Trace, “Consumer evaluation of the quality of online health information: systematic literature review of relevant criteria and indicators,” *Journal of Medical Internet Research*, vol. 21, no. 5, p. e12522, 2019. `https://doi.org/10.2196/12522`.

[18] E. Yuen, N. Winter, F. Savira, C. E. Huggins, L. Nguyen, and P. e. a. Cooper, “Digital health literacy and its association with sociodemographic characteristics, health resource use, and health outcomes: rapid review,” *Interactive Journal of Medical Research*, vol. 13, p. e46888, 2024. `https://doi.org/10.2196/46888`.

[19] D. Schillinger, A. Bindman, F. Wang, A. Stewart, and J. Piette, "Functional health literacy and the quality of physician–patient communication among diabetes patients," *Patient Education and Counseling*, vol. 52, no. 3, pp. 315–323, 2004. https://doi.org/10.1016/S0738-3991(03)00107-1.

[20] R. Schiavo, *Health Communication: From Theory to Practice*. San Francisco: Jossey-Bass, 3 ed., 2023.

[21] N. S. Alharbi, N. Alsubki, S. Jones, K. Khunti, N. Munro, and S. e. a. de Lusignan, "Impact of information technology-based interventions for type 2 diabetes mellitus on glycemic control: a systematic review and meta-analysis," *Journal of Medical Internet Research*, vol. 18, no. 11, p. e310, 2016. https://doi.org/10.2196/jmir.5778.

[22] E. Setiyorini, M. B. Qomaruddin, S. Wibisono, T. Juwariah, A. Setyowati, and N. A. e. a. Wulandari, "Complementary and alternative medicine for glycemic control of diabetes mellitus: a systematic review," *Journal of Public Health Research*, vol. 11, no. 3, p. 22799036221106582, 2022. https://doi.org/10.1177/22799036221106582.

[23] M. Fritz, M. Grimm, I. Weber, E. Yom-Tov, and B. Praditya, "Can social media encourage diabetes self-screenings? a randomized controlled trial with indonesian facebook users," *NPJ Digital Medicine*, vol. 7, no. 1, p. 245, 2024.

[24] A. N. Naef, C. Wilhelm, H. Tezcan-Güntekin, and V. E. Amelung, "Impact of digital health interventions for adolescents with type 1 diabetes on health literacy: a systematic review," *BMC Endocrine Disorders*, vol. 23, no. 1, p. 70, 2023. https://doi.org/10.1186/s12902-023-01321-6.

[25] V. Suarez-Lledo and J. Alvarez-Galvez, "Prevalence of health misinformation on social media: systematic review," *Journal of Medical Internet Research*, vol. 23, no. 1, p. e17187, 2021. https://doi.org/10.2196/17187.

[26] E. M. Kjærulff, T. H. Andersen, N. Kingod, and M. A. Nexø, "When people with chronic conditions turn to peers on social media to obtain and share information: systematic review of the implications for relationships with health care professionals," *Journal of Medical Internet Research*, vol. 25, p. e41156, 2023. https://doi.org/10.2196/41156.

[27] M. N. N. Htay, L. L. Parial, M. C. Tolabing, K. Dadaczynski, O. Okan, and A. Y. M. e. a. Leung, "Digital health literacy, online information-seeking behaviour, and satisfaction of covid-19 information among university students of east and south-east asia," *PLoS One*, vol. 17, no. 4, p. e0266276, 2022. https://doi.org/10.1371/journal.pone.0266276.

[28] W. Mao, J. Li, L. Xu, and I. Chi, "Acculturation and health behaviors among older chinese immigrants in the united states: A qualitative descriptive study," *Nursing and Health Sciences*, vol. 22, no. 3, pp. 714–722, 2020.

[29] A. D. Kurnia, N. L. Masruroh, N. Melizza, Y. B. Prasetyo, and H. N. Hidayani, "Factors associated with dietary behaviour among patients with type 2 diabetes mellitus in rural indonesia," *Journal of ASEAN Federation of Endocrine Societies*, vol. 37, no. 2, p. 60, 2022. https://doi.org/10.15605/jafes.037.02.02.

[30] J. A. Kelak, W. L. Cheah, and R. Safii, "Patient's decision to disclose the use of traditional and complementary medicine to medical doctor: a descriptive phenomenology study," *Evidence-Based Complementary and Alternative Medicine*, vol. 2018, p. 4735234, 2018. https://doi.org/10.1155/2018/4735234.

[31] M. Peimani, E. Nasli-Esfahani, and R. Sadeghi, "Patients' perceptions of patient–provider communication and diabetes care: a systematic review of quantitative and qualitative studies," *Chronic Illness*, vol. 16, no. 1, pp. 3–22, 2020. https://doi.org/10.1177/1742395318782378.

[32] J. Xiao, Q. Wang, S. Tan, L. Chen, B. Tang, and S. e. a. Huang, "Analysis of patient medication compliance and quality of life of physician-pharmacist collaborative clinics for t2dm management in primary healthcare in china: A mixed-methods study," *Frontiers in Pharmacology*, vol. 14, p. 1098207, 2023. https://doi.org/10.3389/fphar.2023.1098207.

[33] X. He, J. Li, B. Wang, Q. Yao, L. Li, and R. e. a. Song, "Diabetes self-management education reduces risk of all-cause mortality in type 2 diabetes patients: A systematic review and meta-analysis," *Endocrine*, vol. 55, no. 3, pp. 712–731, 2017.

[34] Y. M. Alatawi, J. Kavookjian, G. Ekong, and M. M. Alrayees, "The association between health beliefs and medication adherence among patients with type 2 diabetes," *Research in Social and Administrative Pharmacy*, vol. 12, no. 6, pp. 914–925, 2016. https://doi.org/10.1016/j.sapharm.2015.11.006.

[35] A. S. Alzahrani, S. M. Greenfield, S. Shrestha, and V. Paudyal, "Views of healthcare professionals on complementary and alternative medicine use by patients with diabetes: a qualitative study," *BMC Complementary Medicine and Therapies*, vol. 24, no. 1, p. 81, 2024. `https://doi.org/10.1186/s12906-024-04385-6`.

[36] I. G. M. Y. Bakti, S. Sumardjo, A. Fatchiya, and A. F. Syukri, "Public knowledge of diabetes and hypertension in metropolitan cities, indonesia," *Al-Sihah: The Public Health Science Journal*, vol. 13, no. 1, pp. 1–13, 2021. `https://doi.org/10.24252/al-sihah.v13i1.19409`.

[37] D. Nutbeam and J. E. Lloyd, "Annual review of public health," *Annual Review of Public Health*, vol. 42, pp. 159–173, 2021. `https://doi.org/10.1146/annurev-publhealth-090419-102529`.

[38] S. Notoatmodjo, *Ilmu Perilaku Kesehatan.* Jakarta: Rineka Cipta, 2020.

[39] PERKENI, *Konsensus Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 di Indonesia 2021.* Jakarta: PB PERKENI, 2021.