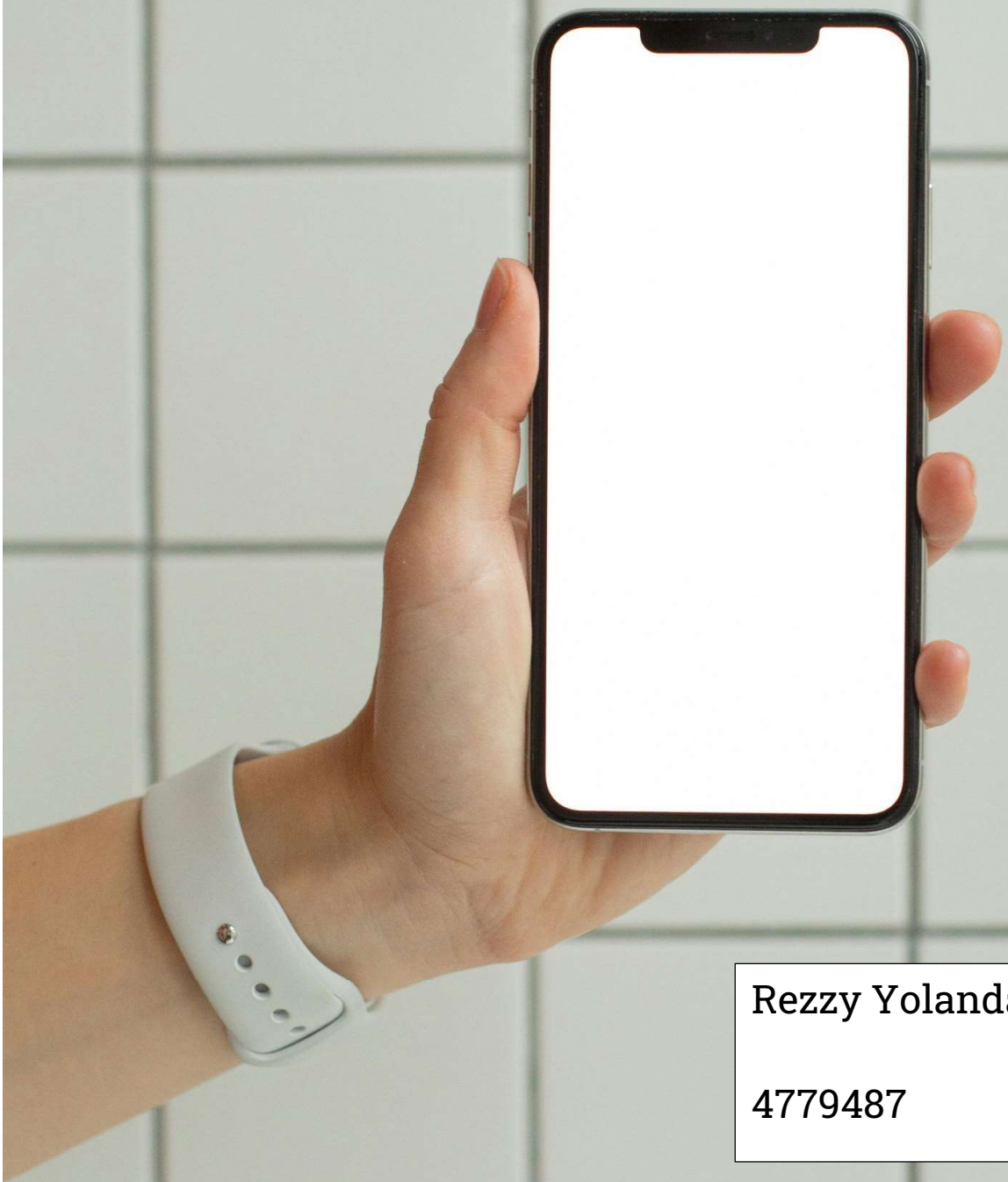
Adoption of Telemedicine in Depression Care: A New Era of Mental Health in Indonesia



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Adoption of Telemedicine in Depression Care: A New Era of Mental Health in Indonesia

By

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Executive Summary

In recent years, there has been a significant increase in the number of depression cases. However, only 9% of depression patients in Indonesia receive appropriate treatment. The rapid advancement of technology highlights the potential for telemedicine to close this gap. Unfortunately, the adoption of telemedicine in Indonesia remains challenging, with only less than 10% of the Indonesian population utilising the technology.

Several factors impact the adoption of telemedicine among its users. The adoption of this technology, including by healthcare professionals, will depend on these factors. To understand the key factors in telemedicine adoption and the potential improvements for it, the following research question is employed:

How can the adoption of telemedicine for depression care be facilitated among healthcare professionals in Indonesia?

This thesis employs exploratory research with qualitative analysis through interviews with mental healthcare professionals in Indonesia for the data collection. The Unified Theory of Acceptance and Use of Technology (UTAUT) is employed as the theoretical foundation. Performance expectancy and effort expectancy are used to find the answer to the main research question. Performance expectancy refers to the degree to which one expects a system to help them raise their job performance, while effort expectancy refers to the degree to which a system is easy to use. Eleven interviewees were interviewed for this research, of whom eight are psychologists, two are psychiatrists, and one is an academic.

In terms of performance expectancy, there are nine key factors that could contribute to the adoption of telemedicine for depression care. These are *improve patient care, expand patient reach, pandemic-driven adoption, feature suitability, limited observational capacity, accessibility, flexibility, improve healthcare professionals' knowledge*, and *patient re-engagement*. In terms of effort expectancy, it was found that five key factors influence healthcare professionals' perceived ease of use towards telemedicine. These are the *lack of telemedicine courses in formal education, availability of technical guidance, pandemic-driven adoption, time limitation*, and *training availability*. As a result, it was found through deeper analysis that education and technology are two additional contributors on UTAUT framework in telemedicine for depression care. Additionally, the findings show that current regulations are still inadequate to provide comprehensive rules related to telemedicine practices in Indonesia.

This research has several limitations. It focuses exclusively on depression care in Indonesia as a country and not specific to certain locations. Interviewees were contacted through LinkedIn and it may exclude healthcare professionals who are not using this platform for their job. The use of qualitative research may result in bias in the analysis. Bias can arise from the researcher's personal experiences and the small number of interviewees in this research.

Future research should consider the same number of psychologists and psychiatrists to investigate the similarities and differences between the two roles in the adoption of telemedicine. It is advisable to explore the location, gender, age, and experience of interviewees to provide more comprehensive result. Future research can also be employed to ensure validity of the *education* and *technology* as two additional contributors in UTAUT to further ensure generalization of the suggested framework in similar cases.

The implications of this research are intended for policymakers, academic institutions, and technology providers. To ensure the proper functioning of telemedicine, policymakers supported by academic institutions should incorporate telemedicine courses into the curriculum and establish formal regulations of telemedicine in the country. Policymakers

should be able to ensure comprehensive regulations that regulate telemedicine practices for depression care in Indonesia. For technology providers, they must ensure that the telemedicine functionalities meet the needs of healthcare professionals in order for them to perform their duties.

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1 Introduction

1.1 Problem Introduction

Depression has emerged as a significant global health concern, with the number of cases rising notably in recent years. In 2019, depression affected an estimated 280 million people, accounting for 5% of all adults (WHO, 2019). In Indonesia, the prevalence of depression is notably high. The national prevalence of depression cases was reported to be 21.8% (Peltzer & Pengpid, 2018). Despite this high prevalence, the rate of treatment for depression remains alarmingly low. Only 9% of people who were diagnosed with depression received treatment, with an average of 8.57% of people in urban ever receiving treatment and 9.64% of people who live in rural areas receiving treatment for depression (Riskesdas, 2018).

Depression can be defined as a mental health problem that is characterized by low mood and loss of pleasure or interest in doing activities for long periods (WHO, 2019). Other symptoms of depression include poor concentration, low self-esteem, disrupted sleep, or hopelessness about the future (WHO, 2023). Studies have examined the link between depression and pain, focusing on how the risk of depression increases as several features of deteriorating pain, such as severity, frequency, length, and number of symptoms (Bair et al., 2003). Bair et al. (2003) also noticed that moderate to severe pain interferes with function, is resistant to treatment, or is linked to worse depression outcomes, such as reduced quality of life, diminished productivity at work, and higher health care usage.

Indonesia's status as an upper-middle-income country contributes to worsening the challenges in depression care. With a population of around 280 million, the country has trouble providing adequate healthcare treatment for its population. The problems range from a lack of adequate medical devices to the shortage of medical health professionals in the country. According to the World Health Organization (2020), there are only 8.135 mental health professionals in Indonesia. With this number, there are only 3.01 mental health professionals for every 100.000 people (WHO, 2020).

The rapid growth of digital technology indicates the ability to provide solutions to overcome the limitations of resources. Digital applications from various sectors have been developed and used by millions of users, including in the healthcare sector. Adopting digital technologies has the potential to enhance the efficiency of healthcare business operations, especially those that could be simplified using information technology, while simultaneously enabling the delivery of better quality and decreased response time, yielding advantages for multiple stakeholders, including national health systems, healthcare professionals, and patients (Laurenza et al., 2018).

Telemedicine has introduced an innovative approach to healthcare, offering people an alternative option for receiving treatment for their medical conditions. Telemedicine provides a feasible answer to the unequal distribution of healthcare resources, making it an increasingly essential alternative for bridging the gap in the capacity and quality of medical services between rural and urban areas (Gao et al., 2022). The word "telemedicine" is more relevant in the context of depression care than "teleconsultation" since it covers a wider range of services and interventions that go beyond consultations. Telemedicine refers to the use of information and communication technologies by healthcare professionals to exchange valid information for diagnosis, treatment, and prevention of disease and injury, with the goal of improving individual and community health (WHO, 2022). However, teleconsultation only focuses on the consultation part of telemedicine, while telemedicine includes other activities,

such as the delivery of distance learning to the patients and the consultation itself (Dhediya et al., 2023).

However, the adoption of telemedicine in Indonesia remains challenging, with less than 10% of the Indonesian population having utilized it (Khotimah et al., 2022). Moreover, numerous challenges in online mental health services in Indonesia hinder the adoption of telemedicine for depression care. These challenges include the attitudes of the users towards online sessions and difficulties in building engagement (Geraldina et al., 2023).

Various factors may influence the adoption of a technology. These factors will greatly affect healthcare professionals and patients, as they will have to incorporate new technology into their daily routines. For healthcare professionals, this may involve adjusting workflows, learning new skills, and ensuring that the technology aligns with patient care standards. Patients, on the other hand, may need to adapt to new ways of receiving care and communicating with their healthcare professionals. The analysis of factors that affect telemedicine usage for depression care is required to ensure that the technology operates as intended.

1.2 Knowledge Gaps

A literature review was carried out to identify knowledge gaps in telemedicine for depression care in Indonesia. A literature review was conducted by utilizing a systematic search approach on Scopus, applying specific keywords to identify relevant articles. The search method employed is shown in Appendix A and Appendix B.

The search method was conducted by employing a search string through Scopus. The search process was carried out by using the title, abstract, and keywords in the article. Keywords used in the search process are shown in Table 1.

Table 1. Keywords in search process

Initial Keywords	Synonyms/Linking Words
Telemedicine	Telepsychiatry, teleconsultation, telehealth, e-health, m-Health, digital health
Depress*	Mental health
Indonesia	Asia or Southeast Asia

The abstract was read to understand the main idea of the articles. Following that, the snowballing technique was employed to find relevant articles that were not included in the search results. Then, the most relevant articles were used for this literature review. Ten articles were reviewed to understand the knowledge gaps about this topic. Those ten articles are shown in Table 2.

Table 2. Articles for knowledge gaps

No.	Article	Summary
1	Lemon et al. (2024)	The research emphasizes the need to integrate mental health services into perinatal healthcare, customize support for caregivers according to local customs, and suggest digital health usage for mental health treatment.
2	Brooks et al. (2023)	This study evaluated the usability, feasibility, and preliminary impact of a digital intervention designed to improve mental health literacy and self-management for anxiety and depression among 11-15-year-olds in Java, Indonesia.
3	Shania et al. (2023)	This article identifies the development and evaluation of a high-fidelity mobile health (mHealth) intervention aimed at addressing depression among adolescents in Indonesia.
4	Orsolini et al. (2021)	The article highlights significant gaps in theoretical and practical training on digital tools and interventions in psychiatry, which impacts the knowledge and readiness of young professionals to integrate digital health solutions into mental health care.
5	Putri et al. (2021)	This qualitative study investigates the challenges and support needs of Indonesian mental health stakeholders, including clinicians, policymakers, and patients.
6	Arjadi et al. (2018)	This article explains about a clinical trial of an internet-based intervention for depression in Indonesia. The findings of this article suggest that online behavioural activation with lay counsellor support could reduce symptoms of depression.
7	Geraldina et al. (2023)	According to the article, there are six challenges to implementing online mental health services in Indonesia: (1) building engagement; (2) risk of distraction during sessions; (3) maintaining professional boundaries during sessions; (4) protecting personal information and confidentiality of sessions; (5) perceived efficacy; and (6) attitudes toward online sessions.
8	Hartini et al. (2023)	This article analyses the challenges and possibilities of digital therapies or mental health services in remote and rural areas of Indonesia. The results show that there are several challenges to implementing this, such as limited access, digital literacy, confidentiality, and access to hardware. However, there are also some possibilities for digital therapies, such as customized solutions and partnerships with other stakeholders in teletherapy.
9	Muzdalifah & Markam (2023)	This article demonstrates the readiness level of telespychiatry in one of the hospitals in Indonesia. The result shows that the readiness level of the telepsychiatry in the hospital is 70.5%. Several improvements are needed, such as workforce for patient registration in telepsychiatry, drug delivery, scheduling, and user-friendly telepsyhiatry application.

No.	Article	Summary
10	Dowrick et al. (2020)	This article discusses the collaborative framework developed by the APEC Digital Hub and WONCA to integrate mental health services into primary care across the Asia-Pacific region.

The lack of research on telemedicine for depression care in Indonesia highlights the significance of this research. The preceding publications serve as an initial foundation for addressing the gaps in knowledge. Arjadi et al. (2018), Hartini et al. (2023), and Brooks et al. (2023) examined digital intervention from the patient's viewpoint. However, they did not consider the viewpoint of healthcare professionals in their research.

Lemon et al. (2024) were unable to address the factors that motivated healthcare professionals to utilize digital health interventions in their work despite providing explanations about mental health services and digital interventions. The absence of elaboration on the adoption factors also applies to the works of Shania et al. (2023) and Muzdalifah and Markam (2023). Shania et al. (2023) conducted a study on the development of mHealth solutions for the treatment of depression, while Muzdalifah and Markam (2023) assessed the level of readiness for telepsychiatry in a hospital in Indonesia. Nevertheless, these two studies fail to clarify the variables that impact healthcare professionals' willingness to employ the technology. Geraldina et al.'s (2023) work addressed the challenges associated with the implementation of online counselling. However, the authors did not explicitly address the adoption of the technology, which could be affected by the obstacles.

Additionally, the lack of knowledge also comes from the regulatory support for depression care in Indonesia. The research of Putri et al. (2021) and Orsolini et al. (2021) needs more details concerning the regulatory support for telemedicine use.

The information presented above identifies knowledge gaps of the factors impacting telemedicine adoption in depression care in Indonesia, as seen through the perspective of healthcare professionals. To close these gaps, research that looks at the current situation of telemedicine practices for the adoption factors of telemedicine in depression care among healthcare professionals is required.

1.3 Research Question

The explanations above resulted in the following main research question (MRQ):

How can the adoption of telemedicine for depression care be facilitated among healthcare professionals in Indonesia?

This research seeks to comprehensively analyse the adoption of telemedicine for depression care among healthcare professionals in Indonesia. The result offers an examination of the factors associated with the adoption. This research examines the present telemedicine practices in Indonesia to provide an understanding of the country's healthcare systems. In addition, an analysis is conducted to offer background knowledge on the current healthcare systems and telemedicine practices in Indonesia.

2 Methodology

2.1 Research Approach

The exploratory research approach will be employed in this research through qualitative methodologies. The exploratory approach is chosen due to its flexibility for the context of the problems that have been limitedly studied. An initial literature review has shown that the research on this topic in Indonesia is still limited, and the challenges of implementing telemedicine for depression care have not been clearly analysed. The usage of this approach would be beneficial to uncover the complexities and factors that affect the adoption of telemedicine technology in the country.

The qualitative method is employed due to its capability to explore a deeper understanding of the experiences of healthcare professionals through the interview. Qualitative research allows for a deeper understanding of experiences, events, and context and enables exploration into aspects of the human experience that are not easily quantifiable (Cleland, 2017). Through this method, the healthcare professionals' experience in telemedicine can be found to understand the way the adoption of telemedicine can be implemented in their role.

2.2 Sub-Research Questions and Research Methods

The main research question, "*How can the adoption of telemedicine for depression care be facilitated among healthcare professionals in Indonesia?"* is answered through several sub-research questions. The sub-research questions are formulated to address the main research question using an exploratory approach employed in this research. The sub-research questions for this research are as follows:

1. *How is telemedicine used for depression care in Indonesia?*

   This sub-research question seeks to understand the way telemedicine could provide depression care in Indonesia. Understanding the workflow of depression treatment in the healthcare system in Indonesia and telemedicine practices in the country are explained in this chapter. The collection of information for this sub-question is conducted by desk research through a collection of data related to depression care in Indonesia. This collection of data will be conducted through grey literature, such as the National Basic Health Research of Indonesia (2018) and the Indonesian Mental Health Act (2014). Additionally literature found through the snowballing from the relevant documents to support the analysis.

2. *How does the use of telemedicine impact healthcare professionals' roles in delivering depression care in Indonesia?*

   This question intends to explain the factors that impact the healthcare professionals' decision to use telemedicine in their role through the performance expectancy factors. Data for this sub-research question is gathered by conducting interviews with healthcare professionals. The questions are related to the way telemedicine affects healthcare professionals' jobs. The result of the interview is then analysed using Atlas.ti by adding codes in the transcription of the interview. The performance expectancy construct serves as the basis to define the current situation of adoption factors for telemedicine in depression care in Indonesia. Chapter 2.3 of this thesis will provide a detailed explanation of the UTAUT framework and the performance expectancy construct.

3. *How do healthcare professionals perceive the ease of use of telemedicine for treating depression care in Indonesia?*

   This sub-research question intends to explore the factors affecting healthcare professionals as they adjust to the usage of telemedicine in their role. Data for this sub-research question is gathered by conducting interviews with healthcare professionals, and information from academics is added as supporting information. The questions are related to the effort needed by healthcare professionals to adjust to the usage of telemedicine in their role. Chapter 2.3 of this thesis will provide a detailed explanation of the UTAUT framework and the effort expectancy construct.

4. *How do factors related to the use of telemedicine among healthcare professionals contribute to the adoption of telemedicine for depression care in Indonesia?*

   This sub-research question explores the key factors that contribute to the adoption through performance expectancy and effort expectancy. An analysis is conducted within the UTAUT framework to identify the components that contribute to the adoption of telemedicine in Indonesia.

2.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

Different frameworks are available to understand the adoption of technology concept. These frameworks can be divided into Adoption & Scale-Up Focus, Adoption Focus, or Scale-Up Focus (Adlung, 2024). In the adoption focus, several frameworks can be employed to better understand the technology adoption. These frameworks include the Diffusion of Innovation Framework, SWOT Analysis, Task Technology Fit (TTF) Framework, and Unified Theory of Acceptance and Use of Technology (UTAUT). However, the Unified Theory of Acceptance and Use of Technology (UTAUT) is chosen for this research. UTAUT is utilized to identify the factors that might influence the adoption of this topic.

The UTAUT model is employed because its comprehensive explanation about technology adoption. Findings confirmed the strength and robustness of the UTAUT model as an explanatory model of acceptance and use of information systems and technology (IS/IT) while also confirming the most relevant determinants of IS/IT adoption (Khechine et al., 2016). Furthermore, UTAUT has been applied to various research to learn about technology adoption, from the banking sector and education to health systems (Attuquayefio & Addo, 2014). The UTAUT framework accounted for 52% of the variance in technology use and 77% of the variance in behavioural intention to use technology in long-term field studies on employees' acceptance of technology (Venkatesh et al., 2016), confirming the robustness of UTAUT to understand technology adoption.

UTAUT is composed of four different constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. This study focuses on performance expectancy and effort expectancy for the analysis. UTAUT was formulated by Venkatesh et al. (2003) to complete the previous theoretical framework existed. UTAUT was found by combining eight different available frameworks: Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Theory of Reasoned Action (TRA), Motivational Model, Combined TAM and TPB, Model of PC Utilization, Innovation of Diffusion Theory, and Social Cognitive Theory. Figure 1 displays the UTAUT framework as the foundation for this research.

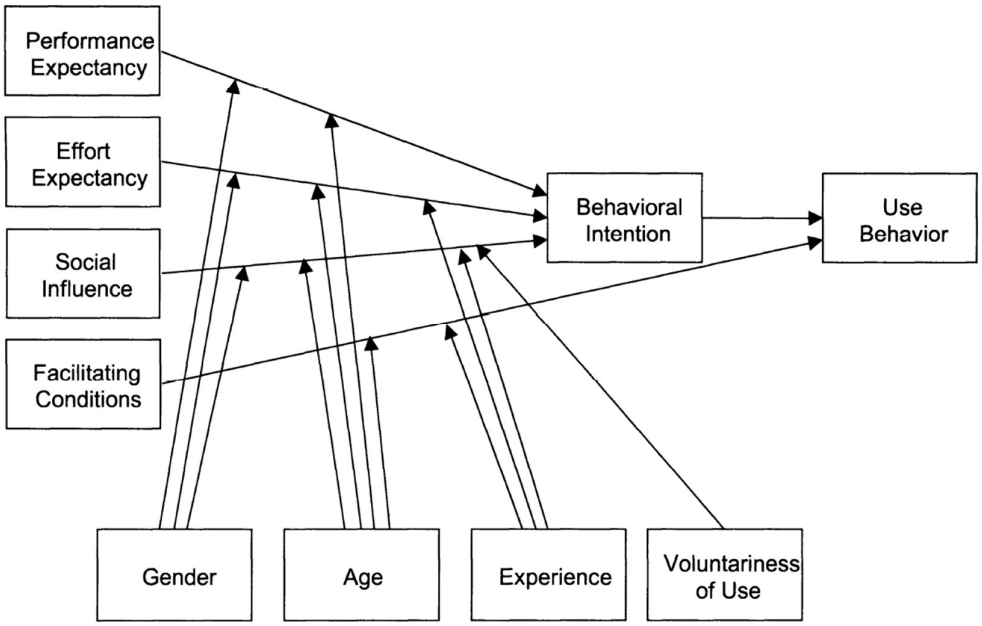


Figure 1. UTAUT Framework (Venkatesh et al, 2003)

UTAUT framework has four main constructs: Performance expectancy, effort expectancy, social influence, and facilitating conditions, with gender, age, experience, and voluntariness of use as the determinants of behaviour intention (Venkatesh et al., 2003). In this thesis, only performance expectancy and effort expectancy are analysed. Performance expectancy is critical because it is directly related to the role of healthcare professionals. This construct can be useful to see how healthcare professionals perceive the benefits of using telemedicine in their role. Users will be inclined to adopt and utilize the system if they believe that it will have a beneficial impact on their performance (Kwateng et al., 2023). In addition, effort expectancy is crucial to understanding the healthcare professionals' efforts in adjusting to telemedicine. Research by Shiferaw et al. (2021) shows that the behavioural intention of the users to adopt telemedicine, especially in low-resource settings, was affected by the effort expectancy factor. Identifying these variables could ensure the telemedicine adoption can be as seamless as possible for healthcare professionals.

By focusing on performance expectancy and effort expectancy, this research addresses the advantages and practicalities of the adoption of telemedicine for healthcare professionals. This approach will help in formulating an understanding of the way telemedicine can be adopted for the healthcare professionals' role in depression care.

2.3.1 Performance Expectancy

Performance expectancy is the degree to which a person expects to improve their job performance through the use of a system (Venkatesh et al., 2003). Five different constructs build this aspect, as seen in Table 3.

Table 3. Performance Expectancy Constructs and Definitions (Venkatesh et al., 2003)

Construct	Source of constructs	Definition
Perceived Usefulness	Davis (1989), Davis et al. (1989)	The degree to which a person believes that utilizing a specific system would improve his or her job performance.
Extrinsic Motivation	Davis et al. (1992)	The belief that users will be motivated to engage in an activity because it is perceived as instrumental in attaining valued outcomes that are not directly related to the activity, such as enhanced job performance, pay, or promotions.
Job-fit	Thompson et al. (1991)	The way capabilities of a system improve an individual's job performance.
Relative advantage	Moore & Benbasat (1991)	The extent to which adopting an innovation is viewed as being superior to using its predecessor.
Outcome expectations	Compeau & Higgins (1995), Compeau et al. (1999)	Outcome expectations are related to the consequences of the behaviour. It was divided into performance expectations (job-related) and personal expectations (personal objectives).

2.3.2 Effort Expectancy

Effort expectancy is defined as the degree of convenience in using a system. This construct has three subconstructs that build it, as seen in Table 4:

Table 4. Effort Expectancy Constructs and Definitions (Venkatesh et al., 2003)

Construct	Source of constructs	Definition
Perceived ease of use	Davis (1989), Davis et al. (1989)	The degree to which an individual believes using a system would be effortless
Complexity	Thompson et al. (1991)	The degree to which a system is seen as somewhat difficult to comprehend and operate.
Ease of use	Moore & Benbasat (1991)	The extent to which an innovation is seen as difficult to utilize.

2.4 Research Flow Diagram

The research flow diagram for this research is shown in Figure 2. This research flow diagram provides a visual representation of the research process.

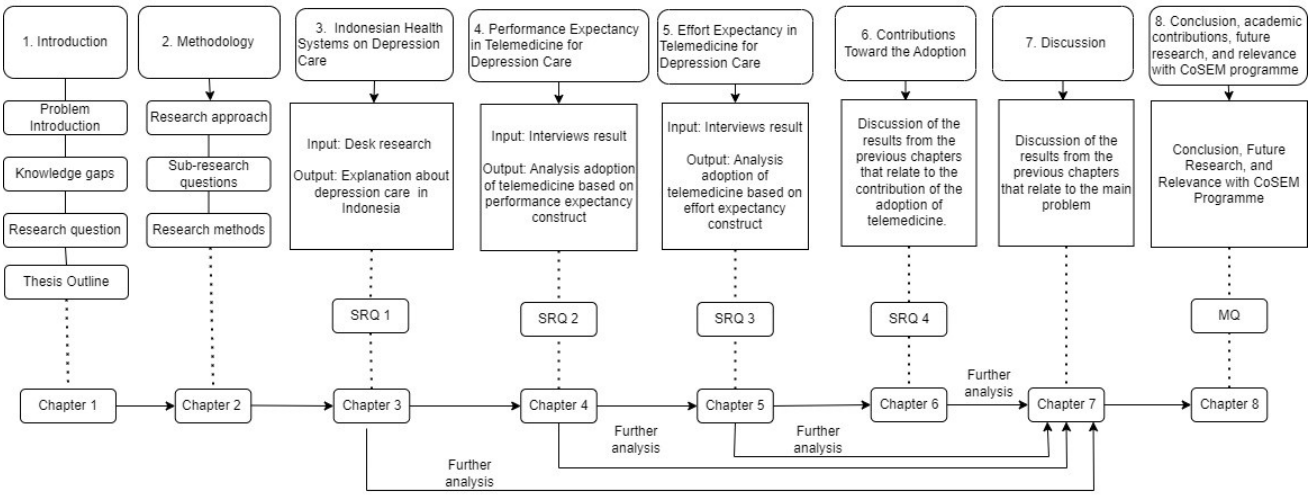


Figure 2. Research flow diagram

This thesis proposal is organized into eight chapters. The first chapter explains the problem introduction, the knowledge gaps identified related to telemedicine for depression care in Indonesia, and the research question. Chapter 2 offers a comprehensive overview of the research methodology employed in this thesis. Chapter 3 answers the first sub-research question about the way Indonesian health systems handle depression cases. Chapter 4 answers the third sub-research question about performance expectancy in the context of the research, followed by Chapter 5, which answers the sub-research question about effort expectancy. Chapter 6 provides an analysis of the contribution of the factors towards telemedicine adoption. Chapter 7 provides a discussion of the findings with the previous research. Chapter 8 concludes the thesis by answering the main research question and includes a discussion of the recommendations for future research and its relevance to the CoSEM program.

2.5 Semi-structured Interviews

Semi-structured interviews are employed in this research to find relevant information from stakeholders. This type of interview utilizes open-ended questions by an interview guide that enables flexibility and depth in data collection (Busetto et al., 2020). The semi-structured interview also emphasizes the participant's role in meaning-making, enabling a deeper study of individual experience and perspective (DiCicco-Bloom & Crabtree, 2006). The flexibility of semi-structured interviews allows for in-depth exploration of this topic, facilitating analysis of areas that have not been widely studied. For this reason, a semi-structured interview was chosen to be employed in this research. This sub-chapter explains the Human Research Ethics Application at TU Delft, interview questions asked during the interview session, selection of interviewees, and completed interviews in this research.

2.5.1 Human Research Ethics Application

All research at TU Delft that involves human research subjects, including Master's theses, requires approval from the Human Research Ethics Committee (HREC) before it can be

conducted (TU Delft, n.d.). As part of the HREC procedure, the researcher is required to submit several documents that contain research-related information to the HREC committee.

The data management plan must be submitted through https://dmponline.tudelft.nl/. The review was submitted to the Faculty Data Steward after the draft was completed. In addition, Informed Consent was prepared for the interview. Informed Consent was designed to provide the interviewee with fundamental information regarding the interview and obtain their consent to utilize the information gathered during the interview for this research. An example of informed consent is provided in Appendix C. An additional document, the Checklist for Human Research, was created to encompass the risk assessment and its mitigation strategy.

Informed Consent, Checklist for Human Research, and Data Management Plan were submitted to the Faculty Data Steward on March 20, 2024. A meeting with the Faculty Data Steward was held on March 21, 2024, to verify the completeness of the documents. These three documents were used as attachments in the research ethics application, which was submitted on March 28, 2024. The research ethics application was approved on April 25, 2024.

2.5.2 Interview Questions

Several sets of questions related to the case were used in interviews with the key stakeholders. The interviewees were divided into two groups, healthcare professionals and academics group. The healthcare professionals' firsthand experiences in telemedicine are crucial to understanding the practical aspects of telemedicine. Academics, on the other hand, offer a theoretical and research-oriented perspective as a complement to the healthcare professionals' experiences. The combination of healthcare professionals' and academics' perspectives can bridge the gap between theory and practice, offering a comprehensive understanding of telemedicine practices for depression care in Indonesia. These two groups of interviewees were divided as below:

1. Healthcare professionals consist of psychologists and psychiatrists based in Indonesia.

2. Academics consist of a researcher who did their research in telemedicine for depression care in Indonesia.

The questions of the interview were divided into four different sections. The first section discussed the general experience of the interviewee in telemedicine. The second section explored the impact of telemedicine on the healthcare professionals' role in addressing the performance expectancy construct. The third section covered the way healthcare professionals adjust to the usage of telemedicine to address the effort expectancy construct. The last section provided additional information needed to gain a better understanding of the considerations that must be taken into account when healthcare professionals need to adopt telemedicine in their role. The interview questions are provided in Appendix D.

2.5.3 Selection Methods

The selection methods of the interviewees were based on these two groups. Several requirements were specified to determine people who were eligible to be the interviewees. The requirements to be eligible as an interviewee from the healthcare professionals group were as follows:

1. The interviewee works as a psychiatrist or psychologist.

2. The interviewee works in Indonesia.

3. The interviewee has experience with telemedicine.

The requirements to be eligible as an interviewee from the academics group were as follows:

1. The interviewee works as a researcher, university professor, or in relevant academic roles.

2. The interviewee works in an academic or research institution in Indonesia.

3. The interviewee has published research in telemedicine practices.

The search approach utilized LinkedIn to identify potential interview candidates. The search query used the terms *"psychologist"* and *"psychiatrist"* with a location filter to specifically include healthcare professionals from Indonesia. In addition, a referral strategy was implemented to find other interviewees who may not be visible through LinkedIn.

2.5.4 Completed Interviews

A total of eleven individuals were interviewed, consisting of eight psychologists, two psychiatrists, and one university professor. All of the interviewees were Indonesian nationals who hold professional positions in Indonesia. The interview was conducted in the Indonesian language for these reasons, including the researcher's fluency in the language. The interviews were conducted between May 6th and May 29th, 2024, utilizing Microsoft Teams as the platform. Prior to conducting the interview, the interviewees received an email with informed consent attached. The interview was recorded using both audio and video, and the transcription was manually written in the Indonesian language. The interview's video and audio recordings are stored in TU Delft's institutional storage and will be retained until September 2028, as per the approved Human Research Ethics Application. The selected interviewees are listed in Table 5.

Table 5. Interviewee ID and role

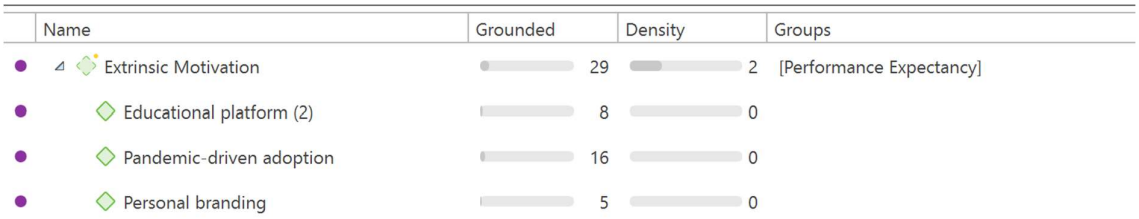
Interviewee ID	Role
A	Psychologist
B	Psychologist
C	Psychologist
D	Psychologist
E	Psychologist
F	Psychologist
G	Psychiatrist
H	Psychologist
I	Psychologist
J	Psychiatrist
K	Academics

Information from healthcare professionals is used to define the factors of telemedicine adoption in performance and effort expectancy. Information from the academics serves as additional information for the analysis of the adoption. The interviewee's IDs are used in the analysis to understand the factors of the adoption of telemedicine for depression care in Indonesia.

2.6 Data Analysis Tool

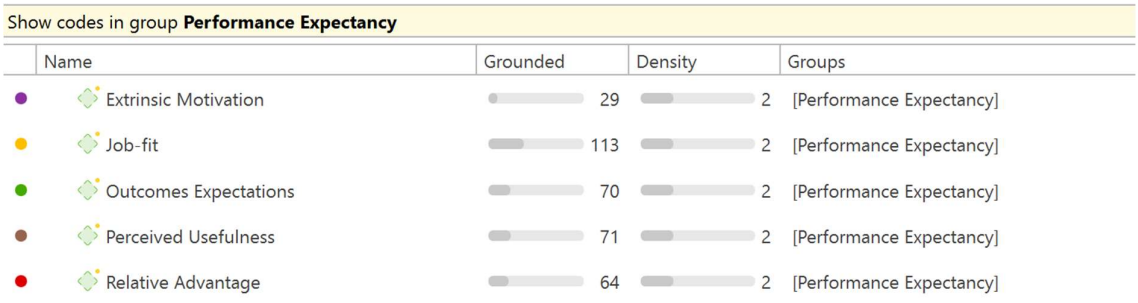
The transcription of the interview was used for the data analysis and conducted using ATLAS,ti. This software was chosen because of its capability to analyse qualitative data such as interview results and literature reviews. Anything seen throughout this practice can thus be collected as a basis for critical thinking and reflection for the research (Rambaree & Nässén, 2021). Factors related to performance expectancy and effort expectancy of telemedicine for depression care in Indonesia is further analysed. The license of Atlas.ti was obtained through the institutional license of the Delft University of Technology.

Inductive and deductive coding were employed to analyse the interview results. In deductive coding, researchers create a qualitative manual that includes a list of preconceived definitions that they use for their data (Tai et al., 2024). Inductive coding requires the researcher to thoroughly examine the textual data and identify codes embedded within the text, enabling the researchers to construct patterns from the data and arrange them into a comprehensive list of themes (Tai et al., 2024). The transcriptions of the interview were analysed by highlighting the related points through the codes, as seen in Figure 3. The codes were then classified into category codes, as seen in Figure 4. The category codes were then classified into the main construct of the UTAUT framework in the group codes, as seen in Figure 5.



Name	Grounded	Density	Groups
Extrinsic Motivation	29	2	[Performance Expectancy]
Educational platform (2)	8	0	
Pandemic-driven adoption	16	0	
Personal branding	5	0	

Figure 3. Example of codes in Atlas.ti



Show codes in group **Performance Expectancy**

Name	Grounded	Density	Groups
Extrinsic Motivation	29	2	[Performance Expectancy]
Job-fit	113	2	[Performance Expectancy]
Outcomes Expectations	70	2	[Performance Expectancy]
Perceived Usefulness	71	2	[Performance Expectancy]
Relative Advantage	64	2	[Performance Expectancy]

Figure 4. Example of category codes in Atlas.ti

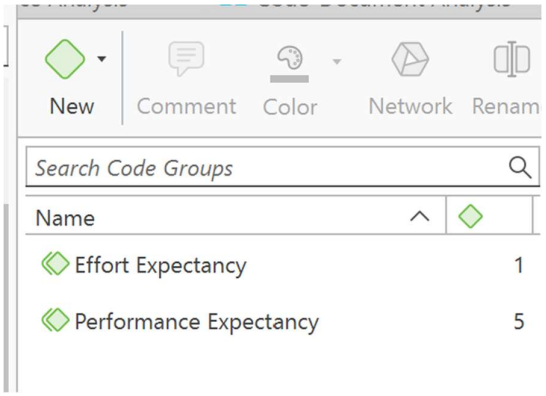


Figure 5. Main construct as group codes in Atlas.ti

The code-document analysis in Atlas.ti was carried out to determine whether the interviewee cited particular factors during the interview in order to identify the key factors in performance and effort expectancy. An example of table analysis is displayed in Table 6. In the table, the letter "V" denotes the factor that the interviewee mentioned, whereas the letter "X" indicates the factor was not mentioned as a factor in the usage of telemedicine. This equation determines the weight of factor (in %):

$$Weight\ of\ factor = \frac{Number\ of\ interviewees\ mentioning\ this\ factor}{Total\ number\ of\ adoption\ factors\ mentioned\ across\ all\ interviewees}$$

The number of adoption factors mentioned divided by the total number of adoption factors mentioned yields the percentage.

Table 6. Example of Analysis

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Improve patient care	V	X	V	V	X	X	X	X	X	V	4	40%
Expand patient reach	X	V	X	V	V	V	V	V	X	X	6	60%
Totals											10	

In the example from Table 6, interviewees A, C, D, and J addressed *improve patient care* during the interview, while the remaining interviewees did not mention the specific factor. This is the reason the total number in column 'Total' is four, as four interviewees referenced it during the interview. In contrast, interviewees B, D, E, F, G, and H all mentioned *expand patient reach* during the interview, while the remaining interviewees did not. Consequently, the total number is six. The percentage is determined by dividing the total number of the specific factor of interest by the total number of factors mentioned across all the interviewees. The calculation percentages for A and B will be as follows:

Weight of factor *Improve patient care*

$$= \frac{Number\ of\ interviewees\ mentioning\ "Improve\ patient\ care"}{Total\ number\ of\ adoption\ factors\ mentioned\ across\ all\ interviewees} = \frac{4}{4+6} x1 = 40\%$$

Weight of factor *Expand patient reach*

$$= \frac{Number\ of\ interviewees\ mentioning\ "Expand\ patient\ reach"}{Total\ number\ of\ adoption\ factors\ mentioned\ across\ all\ interviewees} = \frac{6}{4+6} x1 = 60\%$$

Following this general description of all the factors mentioned in the interviewees, the most prominent factors arising from the interviews were extracted; named 'key' factors. The key factors for each subconstruct were selected based on the factors that scored 50% or above in that subconstruct. The identification of key factors will facilitate the further examination of the aspects that can contribute to the adoption of telemedicine for depression care in Indonesia in Chapters 4 and 5. The threshold of 50% was chosen because it was deemed adequate to capture the significant impact of certain factors on a result, covering half of the factors that affect the adoption of telemedicine among healthcare professionals.

3 Telemedicine on Indonesian Health Systems

This chapter is intended to answer the first sub-research question: *"How is telemedicine used for depression care in Indonesia?".* The objectives of this chapter are to comprehend the workflow of depression care in the healthcare system of Indonesia and to examine the telemedicine practices in the country. Data collection for this sub-question is carried out through desk research involving grey literature sources from the Indonesian government and several relevant articles were found through snowballing technique from the documents.

3.1 Overview of Indonesian Healthcare Systems

The citizens of Indonesia are protected by the Universal Health Care called Jaminan Kesehatan National (JKN). JKN has served as a fundamental pillar of Indonesia's healthcare system, with the objective of ensuring fair and equal availability of public health services to its population (Soraya et al., 2023), including mental health care. Indonesian people can come to the primary care personnel in their cities to get the treatment they need. As part of the program, primary care providers are tasked with diagnosing, treating, and referring patients in need of hospitalization for more serious mental health issues (Bisri & Bakar, 2023). An overview of Indonesian healthcare systems can be seen in Figure 6.

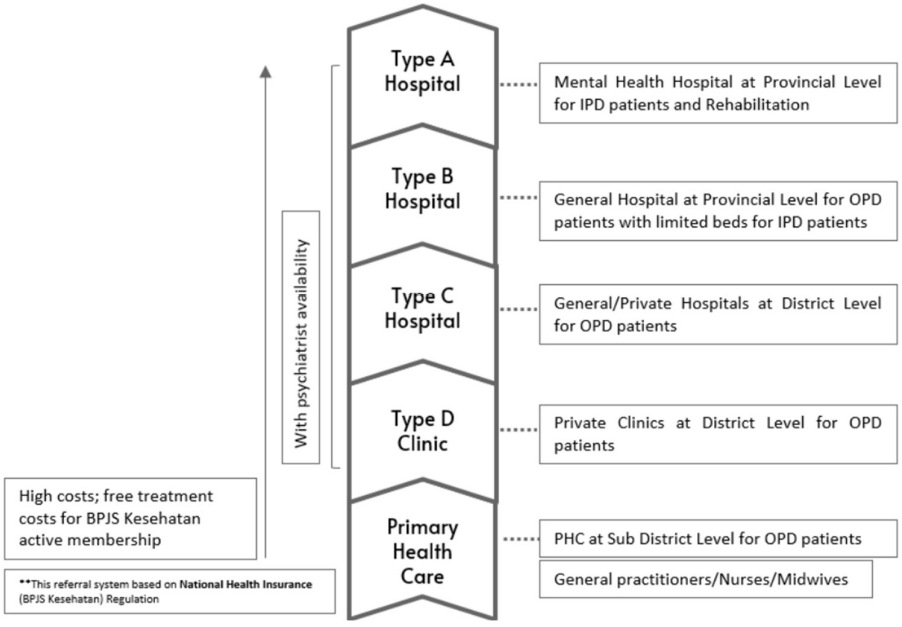


Figure 6. Mental healthcare systems in Indonesia (Munira et al., 2023, p. 111)

Psychiatric care is provided in both secondary and tertiary healthcare settings, with type D clinics offering medical services for psychiatric patients who receive treatment as outpatients department (also referred as OPD), whereas type C hospitals provide medical services at district level for the outpatients, while type B provides treatment for outpatients with limited

beds for inpatients departmend (also referred as IPD), and hospital type C provides treatment for inpatients and rehabilitation (Munira et al., 2023). Patients are eligible to receive treatment in this setting through JKN.

3.2 Regulations in Depression Care

To ensure that mental health care gaps are addressed, Indonesia has regulations that govern depression care in the country. These laws seek to improve mental health care accessibility, improve the awareness of mental health issues in society, and ensure that depression patients receive the appropriate treatment they need. These laws regulate the treatment stages and responsibilities of healthcare professionals as the first responders for depression care in the country.

In 2014, Indonesia's government released the Indonesian Mental Health Act under law number 18/2014. This regulation explains the treatment of depression in the country and who is responsible for carrying out the rules. In this regulation, service facilities are divided into promotive, preventive, curative, and rehabilitative stages (Indonesian Mental Health Act, no. 18/2014). Every stage serves a different purpose and offers different treatment plans for the patient.

In the promotive stage, the effort is meant to maintain and improve mental health in society, eliminate stigma in society, increase participation towards the Act, and increase acceptance of society's mental health awareness (Indonesian Mental Health Act, 18/2014). These efforts are essential to ensure that society can help raise awareness of mental health issues in society. In Indonesia, the stigma associated with depression patients is heard frequently. This could be attributed to a lack of understanding of depression in society, which leads to negative assumptions about the illness.

After the promotive stage, the preventive stage comes along to prevent mental health issues, reduce risks related to mental disorders, and reduce the psychosocial impact on society (Indonesian Mental Health Act, no. 18/2014). A growing number of individuals who are afflicted with mental health issues could be prevented through this stage. To those who are already diagnosed with depression, this could also prevent further psychosocial consequences for them.

The third stage is the curative stage, where this stage has goals of recovery, reducing the suffering of the current patients, and controlling the illness and its symptomps (Indonesian Mental Health Act, 18/2014). The curative stage is crucial for people treated with depression since it guides the recovery process for them.

The last stage is the rehabilitative stage, where the objectives are to prevent the illness from happening, restore social and occupational functions, and prepare people with mental disorders to be independent in society (Indonesian Mental Health Act, no. 18/2014). The final stage aims to prepare people with mental illnesses to integrate into society and restore their social role.

However, the Indonesian Mental Health Act was finally replaced with a new regulation under Law no 17/2023. This regulation combines all health-related regulations, not just those pertaining to mental health cases. In the new regulation, additional information regarding the definition of mental health is added. In this regulation, mental health is defined as a condition in which an individual can develop physically, mentally, spiritually, and socially, allowing the individual to be aware of their abilities, manage stress, work productively, and contribute to their community (Health Law 17/2023).

The responsibilities of healthcare professionals, particularly in the treatment of patients, are regulated by the Ethical Codes of Psychologists and Psychiatrists. These codes govern all aspects of their professional duties.

A clinical psychologist is required to provide a comprehensive explanation before administering any psychological intervention or therapy to their patient based on clinical psychology knowledge that has been scientifically validated (Indonesian Clinical Psychologist Association, 2021). The patient also has the right to ask questions and express objections to any actions that are not appropriate (Indonesian Clinical Psychologist Association, 2021).

Depression can be validated through an evaluation process conducted by healthcare professionals who possess the ability to determine whether a patient suffers from depression. In Health Law number 13/2022, healthcare providers must provide health promotion to society, early detection, and initial treatment or referral if needed (Minister of Health Law number 13/2022). Healthcare professionals fill this capacity through psychologists and psychiatrists.

Other than that, the Indonesian Psychiatric Association provided a self-check for depression signs on their website. The self-check page consists of questions related to the demographic of people who fill out this form and a nine-question self-assessment checklist to guide the users regarding their symptoms. However, the association also noted that this assessment is designed as an early detection tool and not for formal purposes. The patients must go through an assessment provided by the healthcare professionals to ensure the possibility of depression so that the proper treatment can be prepared.

Maintaining confidentiality is crucial whilst treating depression. According to the Indonesian Psychology Association that people everyone undergoing a psychological process – whether it be for research, formal education, training, assessment, or intervention – must sign an informed (Indonesian Psychology Association, 2010). Informed Consent consists of (Indonesian Psychology Association, 2010):

a. Willingness to follow the process without coercion.
b. Estimated time required.
c. An overview of what will be done.
d. Benefits and/or risks experienced during the process.
e. Guarantee of confidentiality during the process
f. The person responsible if something happens adverse side effects during that process.

Despite its formative plan, regulations for depression care have not been sufficiently developed. The Indonesian Mental Health Act is still considered inadequate for healthcare professionals. Research from Bikker et al. (2021) analysed the psychiatrists' view on health regulations, and it shows that the Mental Health Act is considered the first step to improving mental health services and creating awareness in society. Nevertheless, it still lacks practical guidance, and the Ministry of Health should consider the mental healthcare providers' perspective to facilitate the implementation of these health regulations (Bikker et al., 2021).

In telemedicine practices currently, there are no regulations governing online health practices, including device standards, online prescribing, and malpractice protection for telemedicine services (Dewayanti & Firdaus, 2022). This highlights the necessity of additional regulations regulating depression care in digital practices in Indonesia. Current regulation still lacks practical guidance, and the Ministry of Health should consider the mental healthcare providers' perspective to facilitate the implementation of these health regulations (Bikker et al., 2021).

3.3 Telemedicine Regulations in Indonesia

The Indonesian government created the Blueprint of Digital Health Transformation Strategy in 2021 to regulate telemedicine practices. A regulatory sandbox was created to improve telemedicine practices in the country. Several government entities implement legislation that includes the concept of a "sandbox" to provide a regulatory framework and a testing environment that promotes participation and combines infrastructure with emerging technologies and business practices (Aydin & Yardimci, 2024). The government also created a Service Flow for telemedicine practices, which can be seen in Figure 7.

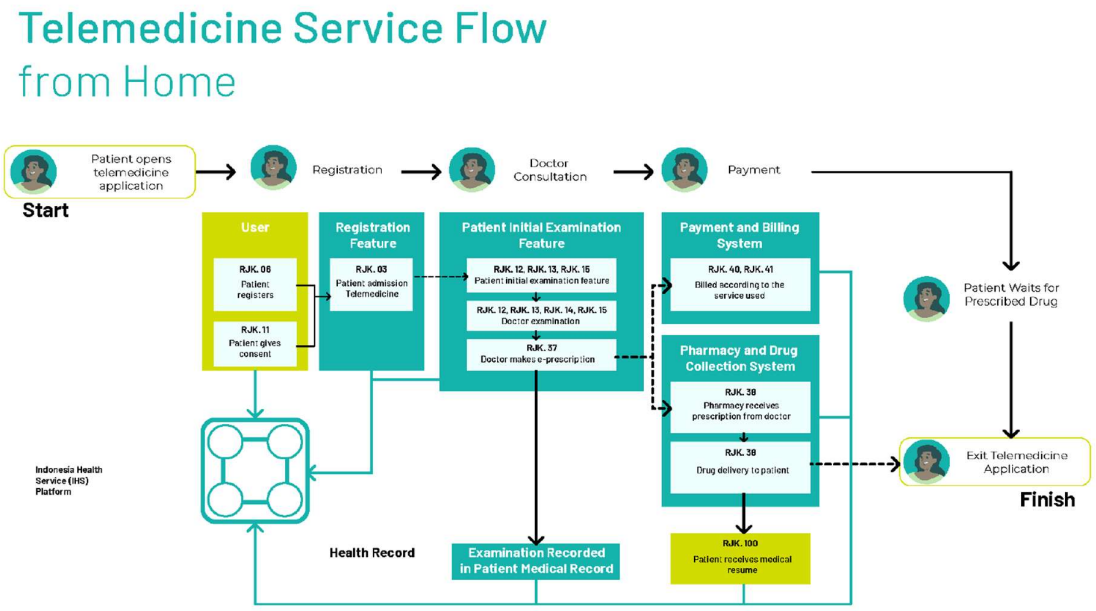


Figure 7. Telemedicine Service Flow (Blueprint of Digital Health Transformation Strategy, 2021, p. 48)

This telemedicine service flow is intended to give guidance to the patients, healthcare providers, and technology developers toward an aligned flow for its health platform. This flow starts from the registration of patients. During the registration, the patient must give their consent for the usage of the application. Then, during the doctor consultation, there will be an initial examination for the patients, and the doctor will make an e-prescription if needed. The payment is billed according to the usage of the service; this includes the payment and delivery of the medicine if needed.

Despite the Indonesian government's regulations of telemedicine and JKN, the the implementation of its workflow still takes a while. Prior to visiting the psychologist, the patients must first contact their primary healthcare provider and obtain a referral. The patients may require several days before they are able to attend their appointment with the psychologist. The absence of Universal Health Care for utilization in present telemedicine practices worsened the issues. Patients who wish to utilize telemedicine services are required to bear the cost themselves or utilize private insurance.

3.4 Summary of the Chapter

The sub-research question *"How is telemedicine used for depression care in Indonesia?"* can be answered by looking at the current practices of mental health care and telemedicine practices in Indonesia. Indonesia has been working on regulations related to depression

treatment in the country. The development of the Indonesian Mental Health Act and Health Law no 17/2023 provide insight into the procedures of treatment for people with depression. These regulations are supported by additional regulations, such as the Ministry of Health Regulation 04/2019, which illustrates the basic services needed to treat depression. The ethical codes provided by the Indonesian Psychological Association add the explanation to ensure that the treatment fulfils its ethical considerations it. Additionally, the Blueprint of Digital Health Transformation Strategy provides insight into the recommendation of telemedicine workflow for patients, healthcare professionals, and technology developers.

Despite its plan, telemedicine regulations have not been widely developed. The regulations are primarily concerned with the development of its technology practice instead of the protocols for both patients and healthcare professionals who utilize this technology. Furthermore, the Indonesian Mental Health Act is still considered inadequate for healthcare professionals, despite considered the first step to improving mental health services in Indonesia.

4 Performance Expectancy in Telemedicine for Depression Care

The purpose of this chapter is to address the second sub-research question: *"How does the use of telemedicine impact healthcare professionals' roles for delivering depression care in Indonesia?".* The analysis using atlas.ti is performed to understand the factors that impact the adoption of performance expectancy in delivering depression care in Indonesia. The analysis utilizes five main subconstructs of UTAUT that are drawn from Venkatesh (2003). Data collection for this sub-research question is carried out through conducting interviews with healthcare professionals.

In performance expectancy, a single factor can be simultaneously incorporated into several subconstructs. For example, the factor of *improve patient care* can have a simultaneous effect on the subconstructs of perceived usefulness, relative advantage, and outcome expectations. This overlap arises from the perception that telemedicine not only enhances the delivery of healthcare by professionals but also offers additional advantages compared to the periods before it was introduced. Furthermore, healthcare professionals expect that the utilization of this technology will lead to improvement in patient care. Therefore, this factor plays a role in multiple subconstructs related to performance expectancy.

4.1 Results

Based on the explanation in Chapter 2.3, there are five different subconstructs in performance expectancy: Perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations. The analysis of the interviews indicates that 18 factors are included in the performance expectancy and impact the healthcare professionals' roles in delivering depression care in Indonesia. These factors are then classified into five subconstructs in performance expectancy, which will be explained in Chapter 4.1.1 until 4.1.5. The factors are listed as shown in Table 7.

Table 7. Factors of Performance Expectancy

No.	Factors	Subconstructs
1	Improve patient care	Perceived usefulness, relative advantage, outcomes expectations
2	Expand patient reach	Perceived usefulness, relative advantage, outcomes expectations
3	Improve healthcare professionals' knowledge	Perceived usefulness, relative advantage, outcomes expectations
4	Improve communication with caregiver	Perceived usefulness, relative advantage, outcomes expectations
5	Enable personal goals	Perceived usefulness, relative advantage, outcomes expectations
6	Telemedicine as educational platform	Perceived usefulness, extrinsic motivation, relative advantage
7	Improve personal branding	Perceived usefulness, extrinsic motivation,

No.	Factors	Subconstructs
		relative advantage, outcomes expectations
8	Pandemic-driven adoption	Extrinsic motivation
9	Feature suitability	Job-fit
10	Limited observational capacity	Job-fit
11	Adaptability to manage complex cases	Job-fit
12	Limited technological facilities	Job-fit
13	Comfortability	Job-fit
14	Confidentiality	Job-fit
15	E-prescription	Job-fit
16	Accessibility	Relative advantage
17	Flexibility	Relative advantage
18	Patient re-engagement	Outcomes expectations

The analysis aims to identify the key factors influencing telemedicine adoption for depression care in performance expectancy. The results are divided based on subconstructs in performance expectancy, with information inside the table indicating whether the interviewee cited the specific factor during the interview. The calculation weight of factors is determined based on the information presented in Chapter 2.6.

4.1.1 Factors in Perceived Usefulness

There are seven factors that impact the adoption of telemedicine in terms of perceived usefulness. Two factors are selected as the key factors for this subconstruct, which are ***improve patient care*** and ***expand patient reach***. The perceived usefulness factors from the interview results are shown in Table 8.

Table 8 . Factors in Telemedicine Adoption of Perceived Usefulness

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Improve patient care	v	v	v	v	v	v	v	v	v	v	10	27.8%
Expand patient reach	v	v	v	v	v	v	x	v	x	v	8	22.2%
Improve individual knowledge	v	v	x	v	v	v	x	v	x	x	6	16.7%
Improve communication with caregiver	x	x	v	v	x	x	x	v	v	x	4	11.1%
Enable personal goals	x	x	v	v	x	x	x	v	x	x	3	8.3%
Improve personal branding	x	v	x	v	x	x	x	x	x	v	3	8.3%
Telemedicine as educational platform	x	x	x	x	x	x	v	x	x	v	2	5.6%
Totals											36	

The results above demonstrate that the interviewees hold different opinions regarding the potential impact of telemedicine usage on their respective roles. ***Improve patient care*** is the

most significant aspect, which carries a weight of 27.8% among all factors. All the healthcare professionals who took part in the interviews believed that telemedicine has the capacity to improve patient care. Telemedicine enables healthcare professionals to provide patient care through online consultations, resulting in this outcome. Telemedicine is beneficial for both returning patients and individuals who may hesitate to do in-person consultations with psychologists or psychiatrists. This approach offers an opportunity to improve patient care by creating a welcoming and easily accessible setting, thereby motivating more patients to seek the assistance they need.

“For patients who want to come to a psychologist for the first time or he/she still hesitate to come to a psychologist, telemedicine can help them because that person does not need to meet face-to-face with the psychologist.” (Interviewee E, psychologist)

In addition to this reason, patients have the option to immediately reach out to healthcare professionals in case of urgent needs. Psychologists and psychiatrists operate on a scheduled basis, and the adoption of telemedicine enables patients to communicate quickly with healthcare professionals.

"If the patients experience an unexpected drop in their well-being today, they have the option to schedule a session for tomorrow promptly. Alternatively, they may also schedule a session for the current day, provided that there are open slots in my schedule." (Interviewee C, psychologist)

The second factor, which is ***expand patient reach***, contributes to 22.2% of the overall factors in perceived usefulness. Telemedicine allows healthcare professionals to extend their services beyond geographical boundaries. They have the ability to provide medical care to patients who are located outside of their city, and in some cases, they even have patients from overseas. Eight out of 10 interviewees mentioned that telemedicine enhances their ability to reach patients in their profession.

“I would like to connect with more people. Not all patients have confidence to seek assistance from psychologists, clinics, or hospitals; certain individuals isolate themselves, and now telemedicine has drawn the curiosity of many people. I aim to connect patients residing in different cities who may have limitations in accessing in-person psychological services.” (Interviewee B, psychologist)

In addition to the two key factors, five additional factors emerged in this subconstruct. Telemedicine has the potential to significantly enhance the expertise and understanding of psychologists and psychiatrists in their respective fields of practice. Telemedicine enables healthcare professionals to participate in sessions aimed at improving their expertise. Hence, the usage of telemedicine can *improve healthcare professionals' knowledge*.

In terms of perceived usefulness, healthcare professionals believe that it is essential for psychologists and psychiatrists to communicate with caregivers to acquire a deeper understanding of the patient's state. Telemedicine can serve as a means to facilitate this interaction. Healthcare professionals can create a connection with the caregiver using telemedicine, which allows for more personalized therapy that meets the patient's specific needs, which leads to *improve communication with the caregiver* factor.

Furthermore, healthcare professionals can utilize the telemedicine platform to *enable their personal goals*. The ability for more patients to find healthcare professionals through this platform can also help them *improve their personal branding*. This factor holds significant importance for them in the current competitive market.

In addition to serving as a counselling platform, *telemedicine can also be utilized as an educational platform*, benefiting both patients and healthcare professionals. Well-informed patients improve the outcome of telemedicine consultations, allowing healthcare professionals to provide better treatment for the patients.

4.1.2 Key Factors in Extrinsic Motivation

Three extrinsic motivation factors impact the utilization of telemedicine among healthcare professionals. ***Pandemic-driven adoption*** is selected as the key factor in this subconstruct, accounting for 58.3% of the weight of factors. Extrinsic motivation factors are shown in Table 9.

Table 9. Factors in Telemedicine Adoption of Extrinsic Motivation

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Pandemic-driven adoption	V	V	X	V	X	X	V	V	V	V	7	58.3%
Improve personal branding	X	V	X	V	X	X	X	X	X	V	3	25.0%
Telemedicine as educational platform	X	X	X	X	X	X	V	X	X	V	2	16.7%
Totals											12	

Seven of ten interviewees stated that the pandemic was the reason they chose to employ telemedicine. During the pandemic, a greater number of healthcare professionals, including psychologists and psychiatrists, transitioned their counselling services to online platforms as a result of the restrictions on physical mobility for their work. The adoption of telemedicine during pandemics can bring both benefits and challenges to the healthcare professionals. On one hand, this facilitates the accelerated implementation of telemedicine. On the other hand, this may cause healthcare professionals to be confused by the abrupt changes in their job responsibilities.

"I obtained my degree in psychology amidst the pandemic. Due to the limited chance for psychologists to have in-person interactions with patients, we had to seek alternative methods. Throughout the pandemic, a significant percentage of people encountered psychological problems. During that period, our only option as psychologists was to integrate telemedicine in order to continue reaching and assisting patients." (Interviewee A, psychologist)

In addition to the pandemic as the key factor, healthcare professionals use this tool due to its ability to *improve personal branding*. This factor is included as external motivation because it relates to external rewards and benefits that healthcare professionals may gain from using telemedicine rather than intrinsic motivation in the technology itself. Establishing a personal brand is essential in order to reach broader demographic of patients who are seeking psychological care. The last factor in this subconstruct is *telemedicine as an educational platform*. Telemedicine serves as an educational platform for patients, compelling healthcare professionals to use this technology in their practice.

4.1.3 Factors in Job-Fit

The job-fit relates to the capability of a system to fit the responsibilities of healthcare professionals during the consultation. There are seven factors that affect telemedicine usage

among healthcare professionals in job-fit, with two of them are the key factors for this subconstruct. Job-fit factors are shown in Table 10.

Table 10. Factors in Telemedicine Adoption of Job-Fit

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Feature suitability	V	V	V	V	V	V	V	V	V	V	10	30.3%
Limited observational capacity	V	V	V	V	V	V	V	V	V	V	10	30.3%
Adaptability to manage complex cases	X	X	V	V	V	V	V	X	V	V	7	21.2%
Limited technological facilities	X	V	X	V	V	X	V	V	X	V	6	18.2%
Comfortability	V	V	X	X	X	X	X	X	V	V	4	12.1%
Confidentiality	X	X	X	V	V	X	X	V	V	X	4	12.1%
E-prescription	X	X	X	X	X	X	V	X	X	V	2	6.1%
Totals											43	

In the subconstruct job-fit, both feature suitability and limited observational capacity have the largest percentage, accounting for 30.3%. ***Feature suitability*** refers to the telemedicine functionalities that are beneficial for healthcare professionals in their work. The interview emphasized features that align with the roles of healthcare professionals. Frequent references to relevant telemedicine features often highlight the lack of real patient identification, which leads to undesirable user behaviour. Consequently, healthcare professionals might express hesitation in adopting telemedicine options.

"Based on my personal experience, telemedicine has previously been utilized for unpleasant pranks. They did not have an actual need for treatment and did not actually have any issues. They either attempted to engage in a conversation with a psychologist or intended to pull a prank on a psychologist. I have previously dealt with patients of a similar nature. I decided to report them to the application provider due to feeling uneasy. In the field of telemedicine, we encounter unidentified patients whose identities and characteristics remain unknown to us due to the usage of anonymous names. We lack information about the individual unless we engage in a video conference." (Interviewee B, pyschologist)

Limited observational capacity is the second most important aspect in subconstruct job-fit. All interviewees claimed that the use of telemedicine led to a decreased capacity to conduct observational assessments during the counselling. Examining patients' gestures is a crucial aspect of healthcare professionals' responsibilities as it contributes to interpreting the patients' emotions. The psychologist or psychiatrist's capacity to provide care for patients through telemedicine can be negatively impacted by their inability to observe the patients' gestures through telemedicine.

"The weakness in telemedicine is that the gestures are not fully captured. It is limited to just the gesture in the screen, whereas some patients may need a connection that extends beyond the screen." (Interviewee J, psychiatrist)

Five additional factors emerged in subconstruct job-fit. The implementation of telemedicine relies on the complexity of the depressive circumstances experienced by the patients. Telemedicine can provide care to people with less severe conditions by connecting them with healthcare professionals. However, in more severe cases, patients may require a combination of telemedicine consultation and in-person consultation. This leads to the *adaptability to manage complex cases* as one of the components in the adoption of telemedicine among healthcare professionals.

Another factor in job-fit is the *limited technological facilities*. The outcome of telemedicine practices is hindered by limitations such as internet connectivity and the availability of devices, impacting both patients and healthcare professionals. This aspect will determine the healthcare professionals' capacity to deliver a thorough consultation to patients.

Three more relevant factors in this subconstruct include *comfortability*, *confidentiality*, and *e-prescription*. From the interviews, healthcare professionals prioritize the comfortability of telemedicine to maximize its use of it in their work. Aside from this, another crucial factor of telemedicine practices is confidentiality, with both healthcare professionals and patients required to maintain confidentiality during the counselling process. Nevertheless, healthcare professionals may not always be able to guarantee that patients will have counselling in a private environment. Some patients might decide to do a therapy session in a public setting, thereby compromising the confidentiality of the counselling process.

The last factor in this subconstruct is e-prescription. Patients receiving online counselling for depression in telemedicine may require e-prescription in their treatment. However, according to the interview findings, the Indonesian Association of Psychiatry advises against prescribing medication during telemedicine consultations.

4.1.4 Factors in Relative Advantage

There are nine factors in the subconstruct of relative advantage that contribute to the adoption of telemedicine among healthcare professionals. Improve patient care, accessibility, flexibility, and expand patient care are the four key factors selected as the most important aspects in this subconstruct. The relative advantage factors from the interview results are shown in Table 11.

Table 11. Factors in Telemedicine Adoption of Relative Advantage

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Improve patient care	V	V	V	V	V	V	V	V	V	V	10	19.2%
Accessibility	V	V	X	V	X	V	V	V	V	V	8	15.4%
Flexibility	X	X	V	V	V	V	V	V	V	V	8	15.4%
Expand patient reach	V	V	V	V	V	V	X	V	X	V	8	15.4%
Improve healthcare professionals' knowledge	V	V	X	V	V	V	X	V	X	X	6	11.5%
Improve communication with caregiver	X	X	V	V	X	X	X	V	V	X	4	7.7%
Enable personal goals	X	X	V	V	X	X	X	V	X	X	3	5.8%

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Improve personal branding	X	V	X	V	X	X	X	X	X	V	3	5.9%
Telemedicine as educational platform	X	X	X	X	X	X	V	X	X	V	2	3.9%
Totals											51	

The three key factors of this subconstruct are to ***improve patient care***, ***accessibility***, ***flexibility***, and ***expand patient reach***. The percentage for *improve patient care* is 19.6%, while both *accessibility*, *flexibility*, and *expand client reach* have 15.7%.

Improving patient care is considered a relative advantage as telemedicine enhances patient care by facilitating easier entry to psychological practices for the patients. The increased number of patients who receive treatment for depression can lead to a decrease in the overall prevalence of depression. The accessibility of telemedicine supports this factor, as it is crucial to ensure that all patients, regardless of their location, receive the necessary care that they need for depression.

"Over time, there has been a rise in the number of telemedicine patients due to the convenience of accessing healthcare professionals and the ability to use it at any time, without being restricted to certain practice hours." (Interviewee A, psychologist)

Telemedicine also enables *flexibility* for healthcare professionals to do their jobs. The healthcare professionals highlighted the importance of flexibility in their role, as it allows them to set their schedule and provide consultations according to their availability. Telemedicine also offers patients flexibility, allowing them to reach out to psychologists or psychiatrists as needed without having to wait for in-person scheduled sessions.

"The advantage of telemedicine is I can conduct counselling sessions from anywhere and at any time, which is very convenient for me." (Interviewee C, psychologist)

The last key factor in this subconstruct is to *expand client reach*. Telemedicine enables healthcare professionals to expand their reach to patients located outside of their cities. The capacity to contact more patients has resulted in the belief that telemedicine is better than in-person consultation.

Moreover, certain factors arise as a consequence of the adoption of telemedicine. Telemedicine enables healthcare professionals to engage in workshops and have academic discussions with their colleagues, which will result in the *improvement of healthcare professionals' knowledge* in their respective fields. Moreover, telemedicine facilitates the *improvement of communication with caregiver of their patients*, a capability that may have been limited prior to the adoption of telemedicine.

Telemedicine also allows healthcare professionals to *enable their personal goals* as psychologists or psychiatrists. The final component of this subconstruct is *telemedicine as an educational platform*, which enables healthcare professionals to educate patients about their mental health concerns.

4.1.5 Key Factors in Outcome Expectations

There are seven factors that affect telemedicine usage among healthcare professionals in terms of outcome expectations. Four factors were selected as key factors for this subconstruct, which are ***improve patient care***, ***expand patient reach***, ***improve healthcare professionals' knowledge***, and ***patient re-engagement***. Outcome expectations factors from the interview results are shown in Table 12.

Table 12. Factors in Telemedicine Adoption of Outcomes Expectations

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Improve patient care	V	V	V	V	V	V	V	V	V	V	10	25.0%
Expand patient reach	V	V	V	V	V	V	X	V	X	V	8	20.0%
Improve healthcare professionals' knowledge	V	V	X	V	V	V	X	V	X	X	6	15.0%
Patient re-engagement	X	V	V	V	V	V	X	X	X	V	6	15.0%
Improve communication with caregiver	X	X	V	V	X	X	X	V	V	X	4	10.0%
Enable personal goals	X	X	V	V	X	X	X	V	X	X	3	7.5%
Improve personal branding	X	V	X	V	X	X	X	X	X	V	3	7.5%
Totals											40	

In outcome expectations, there are four main factors with a percentage greater than 10%. The biggest factor is ***improve patient care***. This factor has been the most important factor not only in outcome expectations but also in subconstructs perceived usefulness and relative advantage. The usage of telemedicine leads to the expectation by the healthcare professionals that this platform can help them to improve the patient care that they provide. The second biggest factor is ***expand patient reach***. In terms of outcome expectations, healthcare professionals expect that the patients are not only coming from their own cities but also from an area far away.

The third and fourth biggest factors are ***improve healthcare professionals' knowledge*** and ***patient re-engagement***. In terms of improving healthcare professionals' knowledge, healthcare professionals have noted that telemedicine has been beneficial in enhancing their knowledge. As a result, when they interact with more patients via telemedicine, they anticipate the possibility of encountering unusual cases during counselling. When it comes to patient re-engagement, healthcare professionals expect that patients are eager to do re-counselling with them, given that depression necessitates ongoing counselling with psychologists or psychiatrists. Furthermore, healthcare professionals expect that patients can come to their offline practices if needed.

"I frequently recommend that patients in telemedicine have recounselling sessions with me." (Interviewee F, psychologist)

Three other factors contribute to the subconstruct outcomes expectations. Healthcare professionals expect that telemedicine can *improve communications with the patient's caregiver* to enhance their comprehension of the patient's condition. Healthcare professionals also expect that this platform will *enable their personal goals*. Furthermore, healthcare professionals utilize this program due to its capacity to *improve personal branding*. Developing a personal brand is essential in order to attract a wider range of people who are in need of medical treatment for depression.

4.2 Weight of Factors in Subconstructs

In addition to these factors, the weight of factors for performance expectancy is summed up to find the comparison between each subconstruct in performance expectancy. Summary from weight of factors for performance expectancy can be seen in Table 13.

Table 13. Weight of factors for subconstruct in performance expectancy

Subconstructs	Total	Percentage weight of factors per all constructs
Perceived usefulness	36	19.7%
Extrinsic motivation	12	6.6%
Job-fit	43	23.5%
Relative advantage	52	28.4%
Outcomes expectations	40	21.9%

The subconstructs which are built by the adoption factors in performance expectancy carry varying degrees of importance in defining performance expectancy across all subconstructs from the perspective of healthcare professionals. The largest ones originate from relative advantage, accounting for 28.4%. The highest percentage indicates that the factors influencing performance expectancy in the adoption of telemedicine starts from the extent to which the healthcare professionals perceive the technology as beneficial in comparison to the prior technology or methods in depression care. The greater the perceived relative benefits, the higher the likelihood of their intention to use telemedicine in their respective roles.

The second largest weight of factors is derived from job-fit, accounting for 23.5%. This indicates that job-fit is an important part of telemedicine usage for healthcare professionals. Telemedicine must be tailored to meet the needs of healthcare professionals so they will be able to utilize this technology in their professional capacity. The third subconstruct is derived from outcome expectations, accounting for 21.9%. This data indicates that healthcare professionals hold significant expectations regarding telemedicine. If telemedicine fulfils these expectations, healthcare professionals are more inclined to use it in their practice.

The fourth factor contributing to the weight is derived from the perceived usefulness with 19.7%. Within this subconstruct, healthcare professionals held the perception that this technology are able to enhance their job performance. These elements are characterized by the presence of positive words in the factors of this subconstruct, such as *improve patient care*, *expand patient reach*, *improve individual knowledge*, *improve contact with caregivers*, *enable personal goals*, and *telemedicine as an educational platform*. The perceived benefits of telemedicine will incentivize healthcare professionals to adopt telemedicine.

The final and least significant comes from extrinsic motivation. This demonstrates that although there may be certain external motivations that drive individuals to utilize telemedicine in their job, the overall influence may not be particularly significant when compared to other factors.

The analysis of the different perceptions between the psychologists and psychiatrists is seen in Figure 8. This research has an imbalanced number of psychologists and psychiatrists, where the analysis reflects this. This analysis is conducted as additional information of each role of healthcare professionals towards the performance expectancy factors.

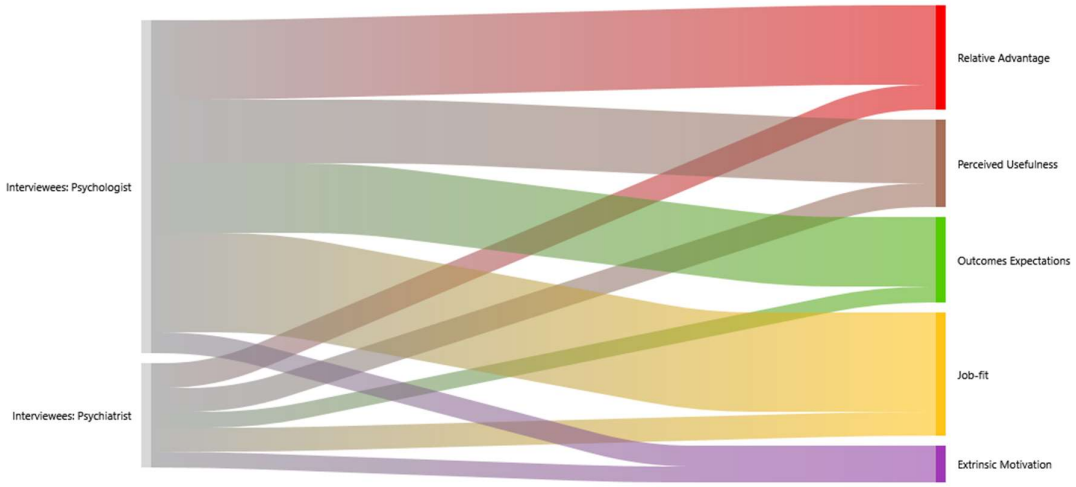


Figure 8. Differences of Perception between Roles

The differences between psychologists and psychiatrists in all the subconstructs and factors of performance expectancy are not significant. The sole distinction stems from job-fit, where a factor called e-prescription is only relevant to the responsibilities of psychiatrists, while in Indonesia, psychologists are unable to directly prescribe mental health medications. Depression medication falls under the category of psychotropics, so only psychiatrists have the authority to prescribe it to their patients.

4.3 Summary of the Chapter

The sub-research question *"How does the use of telemedicine impact healthcare professionals' roles for delivering depression care in Indonesia?"* can be answered through interviews with healthcare professionals. According to the interviews, there are 18 factors in performance expectancy that influence healthcare professionals' decision to use telemedicine in relation to performance expectancy. These factors are *improve patient care*, *expand patient reach*, *improve healthcare professionals' knowledge, improve communication with caregiver, enable personal goals, telemedicine as educational platform, pandemic-driven adoption, improve personal branding, feature suitability, limited observational capacity, adaptability to manage complex cases, limited technological facilities, comfortability, e-prescription, accessibility, flexibility*, and *patient re-engagement*.

These factors are divided into five subconstructs in UTAUT: Perceived usefulness, extrinsic motivation, job-fit, relative advantage, outcome expectations. From these factors, nine of them are classified as the key factors, these are *improve patient care*, *expand patient reach*, *pandemic-driven adoption, feature suitability*, *limited observational capacity*, *accessibility*, *flexibility*, *improve healthcare professionals' knowledge*, and *patient re-engagement*.

However, the analysis indicates that the weight of factors among the five subconstructs in performance expectancy varies in terms of percentage. Perceived usefulness, job-fit, relative

advantage, and outcome expectations have a similar number of factors, while extrinsic motivation has a lesser amount weight of factors. This finding suggests that extrinsic motivation has a lesser impact on the adoption of telemedicine among healthcare professionals in depression care.

5 Effort Expectancy in Telemedicine for Depression Care

This chapter is intended to answer the third sub-research question: *"How do healthcare professionals perceive the ease of use of telemedicine for treating depression care in Indonesia?".* The objective of this question is to examine the factors that influence healthcare professionals' adaptation to the use of telemedicine in their work, focusing on the concept of effort expectancy. Data collection for this sub-research question is carried out by conducting interviews with healthcare professionals, added by the information from academics. The questions related to the way healthcare professionals perceive the ease of use of telemedicine for treating depression in Indonesia.

5.1 Factors in Effort Expectancy

From analysis, there are 13 factors that are relevant to the effort expectancy of this research. The analysis is conducted to find the key factors in telemedicine adoption for depression care in effort expectancy. These factors are classified into subconstruct *perceived ease of use*. According to Venkatesh et al. (2003), the original subconstruct in effort expectancy comprises complexity, ease of use, and perceived ease of use. However, defining the differences between these three subconstructs from the interview results is challenging due to their close similarity in definition. In this research, the result is divided based on the subconstruct's perceived ease of use, with the information inside the table explaining whether the interviewee mentioned the specific factors during the interview.

Five factors are considered as the key factors in the effort expectancy, which are ***lack of telemedicine courses in formal education***, ***availability of technical guidance***, ***pandemic-driven adoption***, ***training availability***, and ***time limitation***. The factors in effort expectancy are shown in Table 14.

Table 14. Identification of Key Factors of Effort Expectancy

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Lack of telemedicine courses in formal education	V	V	V	V	V	V	X	V	V	V	9	17.0%
Availability of technical guidance	V	V	V	V	V	V	X	V	V	X	8	15.1%
Pandemic-driven adoption	V	V	X	V	X	X	V	V	V	V	7	13.2%
Training availability	V	V	V	V	V	V	X	V	X	X	7	13.2%
Time limitation	V	X	X	V	V	V	V	V	x	V	7	13.2%

Factors	Interviewee										Total	Weight of Factors
	A	B	C	D	E	F	G	H	I	J		
Enforcement of ethical codes	X	V	V	V	X	V	X	V	V	X	6	11.3%
Ease of problem reporting	V	V	X	X	V	V	X	X	X	V	5	9.4%
Healthcare professionals' preference	V	X	X	V	V	X	X	X	V	X	4	7.5%
Availability of mentorship programme	X	X	X	V	V	V	X	X	X	X	3	5.7%
Tech proficiency	X	V	X	X	X	X	X	X	V	X	2	3.8%
Overlapping patients counselling	X	X	X	X	X	V	X	X	X	V	2	3.8%
Lack of standardized psychoeducation materials	X	X	X	X	X	X	X	X	X	V	1	1.9%
Lack of formal regulations	X	X	X	V	X	X	X	X	X	X	1	1.9%
Totals											62	

Healthcare professionals require varying times to adapt to telemedicine. Six of the ten interviewees need approximately one to three months to adjust to the technology; three only need several days, while the other one needs almost six months. The most significant factor, accounting for 17.0%, is the ***lack of telemedicine courses in formal education***. The lack of telemedicine courses in the formal education of psychologists and psychiatrists influences their decisions to adapt to telemedicine. Additional information from an interviewee who works as an academic mentioned that there is an e-health course in the Faculty of Computer Science at her university. However, the Faculty of Psychology at her university does not offer any courses relating to this technology.

"There is a course on e-Health in the Faculty of Computer Science, but not in the Faculty of Psychology." (Interviewee I, academics)

Additionally, another healthcare professional mentioned that she did not get the telemedicine course when she did her education at the university.

"Yes, in our studies, there was no direction on handling patients online or via telemedicine. Even though such applications existed, our professors did not consider them a primary option for handling patients." (Interviewee A, psychologist)

The next factor is the ***availability of technical guidance***, accounting for 15.1% of the factors. Technical guidance is essential for healthcare professionals to use the application properly. This guidance would help them become proficient with the usage of this application and enable them to understand and implement best practices for consultations.

"Some applications have technical guidelines on how to accept patients initially and how to handle them." (Interviewee A, psychologist)

The next key factors - pandemic-driven adoption, training availability, and time limitation - have the same amount of weight factors, accounting for 13.2% for each of them. Telemedicine has been available in Indonesia before the pandemic happened. However, the adoption of this technology is not widely used. The ***pandemic-driven adoption*** forced healthcare professionals to adjust quickly to telemedicine due to these sudden changes in their job conditions. The pandemic has brought attention to how critical telemedicine is to delivering accessible healthcare, particularly for patients who are unable to visit hospitals because of travel limitations or quarantine restrictions. This change has forced numerous healthcare providers to reassess their workflows and practices to allow remote consultations and treatments.

"Before the pandemic, telemedicine was something I used to complement offline counselling, as the primary method was still face-to-face counselling. However, since the pandemic, there has been a significant shift where psychologists are required to stay safe while still providing services, so we had no choice but to adopt this innovation. Telecounseling, which became widespread starting in 2020, essentially began with the pandemic." (Interviewee J, psychologist)

Training availability also affects the way healthcare professionals adapt to telemedicine. Despite psychologists and psychiatrists having their own associations, there are not many telemedicine-related training courses available. Healthcare professionals have to adjust and learn telemedicine by themselves to be able to use this application in their daily lives.

"Honestly, there aren't many training sessions focused on telemedicine. We mostly learn independently to adjust and develop our skills for serving patients through these apps." (Interviewee A, psychologist)

The interviews also indicate that healthcare professionals' adoption of telemedicine is influenced by the training they receive from their associations.

"During the time I've had my practice permit, there hasn't been any training related to telemedicine from the association." (Interviewee C, psychologist)

The last key factor is the ***time limitation***. Time limitations during online counselling affect how healthcare professionals deliver the treatment. During the interview, the time limit for telemedicine practices ranges from 30 to 60 minutes. However, in offline consultations, patients may be able to have consultations for up to 2 hours. During this limited time, healthcare professionals should be able to give proper therapies to their patients. If the time limit expires during a telemedicine consultation, the treatment will immediately end. This implies that healthcare professionals must utilize the available time to provide the most possible treatment for patients.

"At first, I was confused about how to manage the time because it meant that in 30 minutes, I had to complete the opening, assessment, intervention, and closing during the online consultation. I need adjustment until I find the rhythm and understand by which minute I should be giving advice." (Interviewee E, psychologist)

Eight other relevant factors affect the healthcare professionals on adopting to the usage of telemedicine in their role, despite not being considered as critical factors of the adoption. Three factors contributing to the adoption relate to the regulations; this includes the enforcement of ethical codes, the lack of formal regulations, and the lack of standardized psychoeducation materials. The *lack of formal regulations* has an impact on the way in which healthcare professionals deliver care, as they are unsure of the appropriate protocols for utilizing this platform. The need to enhance the implementation of ethical principles is included due to the lack of legislative regulations related to telemedicine in Indonesia. Government

rules are crucial for ensuring the effective administration of telemedicine and for delineating the obligations of healthcare professionals. Implementing these standards will facilitate the clarity of procedures, safeguard patient confidentiality, and ensure the delivery of high-quality healthcare through telemedicine platforms.

"The regulations are causing confusion among healthcare professionals, as they have not been fully formulated yet." (Interviewee D, a psychologist)

The *lack of standardized psychoeducation materials* is also associated with the way in which healthcare professionals adapt to telemedicine practices. Psychoeducation is a crucial aspect of therapy in depression. The *lack of standardized psychoeducation materials* restricts their ability to adapt, as they need to gather the necessary materials by themselves to educate their patients.

“One component of depression therapy is psychoeducation, which involves providing psychological education not only to the patient but also to their family. I believe telemedicine will be very helpful in this. I usually have booklets or posters that I can share during the session. Sharing the screen also allows me to show these materials. Personally, repeating the same information takes too much time if I have to create it from scratch. Having standardized materials in telemedicine makes the process go quicker, so we can have a checklist of what needs to be covered in the education session.” (Interviewee J, psychiatrist)

The *enforcement of ethical codes* throughout the consultation also affects the telemedicine adoption, as there is no clear enforcement of the ethical codes in place. Healthcare professionals are obligated to adhere to the ethical rules of their respective roles. The implementation of this ethical conduct has an impact on their utilization of telemedicine for patient treatment.

“Perhaps there are additional ethical codes or more concrete implementation of the ethical codes for telemedicine. During offline sessions, for example, there are strict guidelines that prohibit any physical contact of the healthcare professionals with patients. Given the limitations of telemedicine, what are the precise ethical guidelines that apply to this field?” (Interviewee H, psychologist)

Additional factors arose in effort expectancy. The *ease of problem-reporting* procedures directly impacts the level of convenience experienced by healthcare professionals when utilizing telemedicine. Several telemedicine providers do not provide a sufficient tool or process for reporting problems within their apps. *Healthcare professionals' preferences* also influence their decision-making about the utilization of telemedicine. During the interview, a psychologist highlighted the fact that telemedicine allowed her to sustain her professional activities despite having to move to a different city due to her husband's job. This explanation leads her to prefer working as a psychologist through telemedicine rather than providing in-person counselling. In addition, the *availability of mentorship program* contributes to the healthcare professionals' adjustment to the use of telemedicine. Healthcare professionals may seek advice from colleagues who have already implemented telemedicine or have established a mentorship program in their psychology office to facilitate their transition to telemedicine.

To use telemedicine, healthcare professionals must possess a fundamental comprehension of technology in order to grasp the function of telemedicine. Having a high level of *tech proficiency* will allow them to effectively utilize telemedicine in their professional capacity and handle any potential issues that may occur during the consultation. Finally, the last factor is related to *overlapping patients' counselling*. The simultaneous counselling in telemedicine has an impact on how healthcare professionals adjust to telemedicine. During the interviews, two healthcare professionals discussed the challenging nature of providing consecutive counselling sessions when they first started using telemedicine.

5.2 Summary of the Chapter

This chapter is intended to answer the third sub-research question: *"How do healthcare professionals perceive the ease of use of telemedicine for treating depression care in Indonesia?"* The effort expectancy in this research uses perceived ease of use as the subconstruct.

In terms of effort expectancy, 13 factors were found during the interview that relate to the effort expectancy. These factors are classified into perceived ease of use as the only subconstruct in effort expectancy. Of these 13 factors, five are considered as the key factors. These are the *lack of telemedicine courses in formal education*, *availability of technical guidance*, *pandemic-driven adoption*, *time limitation*, and *training availability*.

6 Contributors to Telemedicine Adoption for Depression Care in Indonesia

The purpose of this chapter is to address the fourth sub-research question: *"How do factors related to the use of telemedicine among healthcare professionals contribute to the adoption of telemedicine for depression care in Indonesia?"*. The results analysed in Chapters 4 and 5 are analysed to understand the way these factors contribute to the adoption of telemedicine among healthcare professional for the depression care in Indonesia.

6.1 Analysis of Factors: Education and Technology as Facilitating Contributors

From the analysis in chapter 4 and 5, several factors in performance and effort expectancy are considered critical to ensure the adoption of telemedicine for depression care in Indonesia. In performance expectancy, these factors are divided into five different subconstructs: Perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcomes expectations. The key factors of telemedicine adoption among healthcare professionals for depression care in Indonesia in performance expectancy are *improve patient care, expand patient reach, pandemic-driven adoption, feature suitability, limited observational capacity, accessibility, flexibility, improve healthcare professionals' knowledge*, and *patient re-engagement*. In effort expectancy, several factors are deemed as critical factors, these are *lack of telemedicine courses in formal education, availability of technical guidance, pandemic-driven adoption, time limitation*, and *training availability*.

These factors then classified into two main contributors for telemedicine adoption: *Education* and *technology*. In the following sections, the role of education and technology taken from these key factors are discussed as the facilitating contributors toward telemedicine adoption for depression care among healthcare professionals. Chapter 6.1.1 discusses the role of education as a contributing factor, whereas Chapter 6.1.2 focuses on the role of technology as another contributing factor towards telemedicine adoption.

6.1.1 Education as the Contributor Towards Telemedicine Adoption

Within the construct of effort expectancy, three out of the five key factors are related to the knowledge component possessed by healthcare professionals. These are the *lack of telemedicine courses in formal education*, *availability of technical guidance*, and *training availability*. These factors can influence the perceived advantages of telemedicine in improving healthcare professionals' knowledge. Figure 9 visualizes the explanation about these key factors.

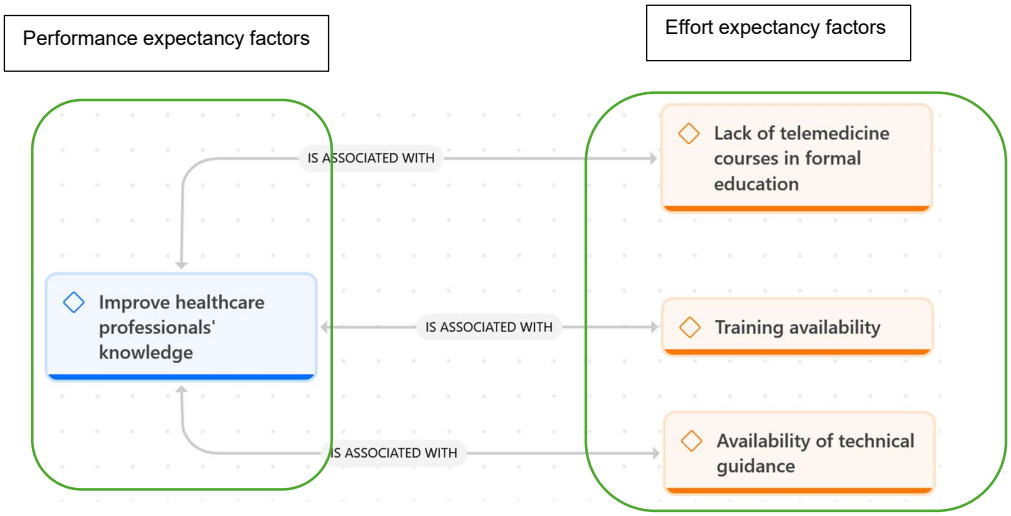


Figure 9. Education Contributor in Telemedicine Adoption (author's own)

Telemedicine is perceived as useful to improve healthcare professionals' knowledge. However, the interview results indicate that there is a notable lack of telemedicine courses in formal education for healthcare professionals. Improving the knowledge of healthcare professionals can be addressed by focusing on the formal education they learn during their studies. Having a fundamental understanding of how to utilize telemedicine in the role they hold can provide healthcare professionals with a solid foundation to enhance their expertise using this platform.

The availability of training also impacts the ability of healthcare professionals to enhance their professional knowledge. The training that healthcare professionals get during their employment would influence their perception of the benefits of utilizing telemedicine in their role. Healthcare professionals that receive comprehensive training and have extensive knowledge through their formal education will feel more at ease while using telemedicine during consultations. Furthermore, providing technical guidance to employ telemedicine platform can enhance their understanding and proficiency in utilizing telemedicine.

6.1.2 Technology as the Contributor Towards Telemedicine Adoption

Some other key factors in performance expectancy and effort expectancy are related to the technological features of telemedicine. Telemedicine may be subject to several constraints associated with its technological features. During the interviews, *time limitation* emerged as one of the key factors in effort expectancy. Interview findings show that time limitation is the cause of the limited observational capacity that the healthcare professionals are able to do while doing consultation. The ability to observe is a crucial aspect of healthcare professionals' role, as they need to be able to see patients' gestures to understand their emotions. The time limitation necessitates healthcare professionals to adapt their approach to providing care for depression care.

The feature suitability is also discussed together with time limitation, as healthcare professionals are only allowed to conduct consultations for 30-60 minutes via telemedicine. During the interviews, healthcare professionals have stated that video calls are the most relevant feature in telemedicine with the time limit provided by the telemedicine platform,

compared to consultation with chat or voice call. During video calls, they can still observe the gestures of patients, although their ability to do so is limited compared to an in-person session.

Moreover, feature suitability in telemedicine impacts the flexibility of healthcare professionals in carrying out their jobs. While telemedicine provides flexibility for them to conduct consultation, healthcare professionals do not have the freedom to choose the duration of consultation. They are only able to provide consultation within the time limit established by the telemedicine platform. Figure 10 visualizes the explanation of these key factors.

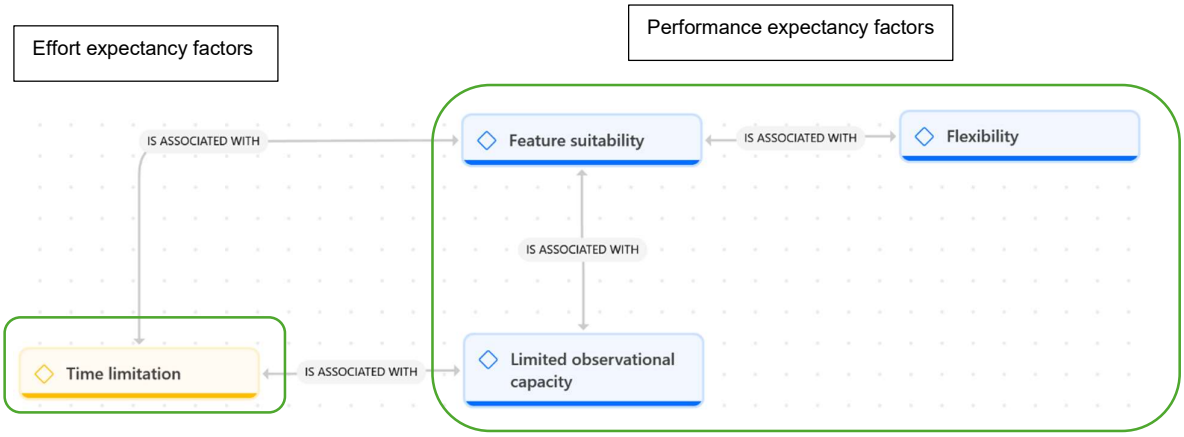


Figure 10. Technology Contributor in Telemedicine Adoption (author's own)

6.2 Integrating Contributing Factors to UTAUT Framework in Telemedicine Adoption for Depression Care

Venkatesh et al. (2003) suggest that gender, age, experience, and voluntariness of use are the contributors of the behavioural intention of using technology in UTAUT. However, the analysis conducted in Chapters 6.1 and 6.2 reveals that the adoption of technology might be affected by some other contributors in addition to the gender, age, experience, and voluntariness of use. The findings suggest that the *education* and *technology* features of telemedicine also influence the behavioural intention to adopt telemedicine for depression care among healthcare professionals. Figure 11 illustrates the addition of *education* and *technology* to the UTAUT framework.

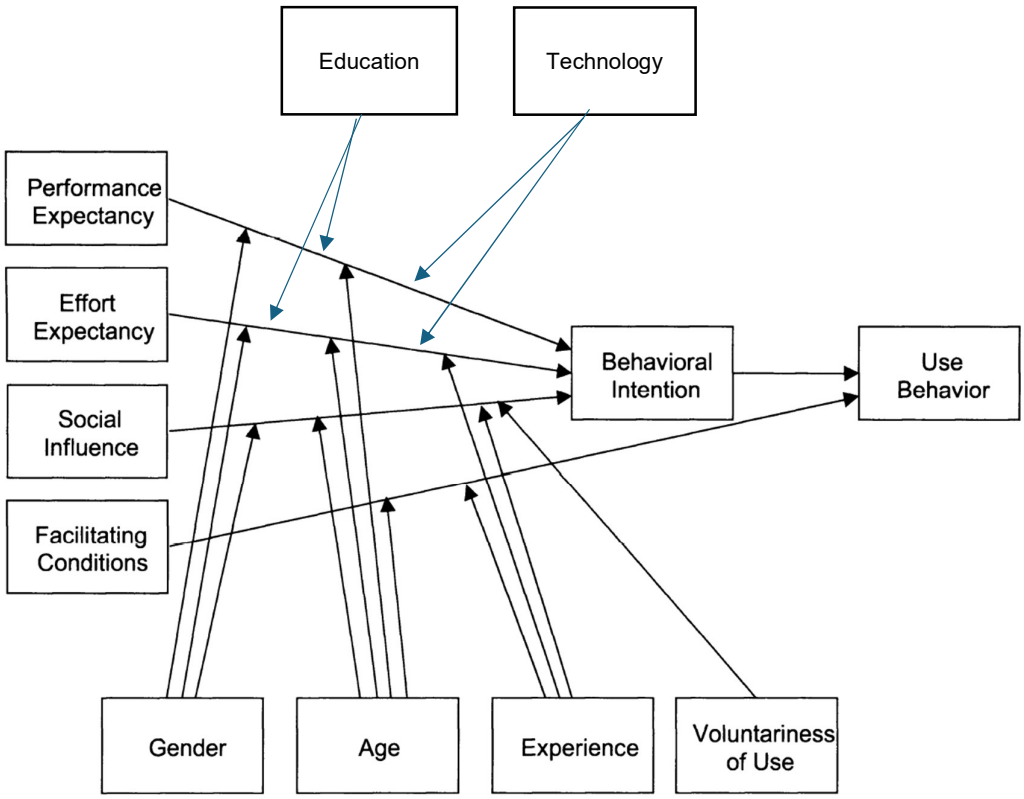


Figure 11. UTAUT framework for Telemedicine Adoption in Depression Care

6.3 Summary of the Chapter

This chapter is intended to answer the sub-research question: *"How do factors related to the use of telemedicine among healthcare professionals contribute to the adoption of telemedicine for depression care in Indonesia?"* From the findings, *education* and *technology* emerged as the additional contributors for telemedicine adoption for depression care within the UTAUT framework.

In the *education* domain, the healthcare professionals' knowledge will affect the perceived benefits of telemedicine to improve healthcare professionals' knowledge. The lack of telemedicine courses in formal education, training availability, and availability of technical guidance will directly impact the knowledge that the healthcare professionals have. In the *technology* domain, the time limitation in effort expectancy is correlated with the feature suitability and limited observational capacity perceived by the healthcare professionals in performance expectancy. This will furhter affect the flexibility of telemedicine utilization itself by the healthcare professionals.

Modifications may be necessary for the application of the prior framework developed by Venkatesh et al. (2003) in the context of telemedicine for depression care. Education and technological aspects are considered as contributors to enhance the adoption of telemedicine for depression care among healthcare professionals.

7 Discussion

This chapter provides further analysis of the findings presented in Chapters 3, 4, 5, and 6. This includes the analysis of the problem context and exploring how the analysis compared to the previous research in telemedicine adoption.

7.1 Adoption of Telemedicine Among Healthcare Professionals

Research about telemedicine in Indonesia primarily focuses on the patient's perspective, with the research by Arjadi et al. (2018), Hartini et al. (2023), and Brooks et al. (2023) did not address the telemedicine practices from the healthcare professionals' point of view. However, healthcare professionals who are also telemedicine users must also be taken into account when practising telemedicine. This research attempts to address the lack of research on telemedicine for depression care among healthcare professionals to understand the healthcare professional's perspective on the adoption of telemedicine practices in their role. These findings are backed by existing research, which indicates that the mental health application should be designed with patients and healthcare professionals in mind. Additionally, Shania et al. (2023) found that no mental health app currently meets all of their demands. Thus, users may need to download two or more apps to fulfil the users' needs.

The analysis shows that there are several factors contributing to the adoption of telemedicine for healthcare professional's role in depression care from the perspective of healthcare professionals. In performance expectancy, several factors affecting healthcare professionals are *improve patient care, expand patient reach, pandemic-driven adoption, feature suitability, accessibility, flexibility, improve healthcare professionals' knowledge*, and *patient re-engagement*. In terms of effort expectancy, there are five main factors that affect the adoption of telemedicine by healthcare professionals: *Lack of telemedicine courses in formal education, availability of technical guidance, pandemic-driven adoption, time limitation*, and *training availability*.

Pandemic-driven adoption becomes the only factor that is crucial for performance and effort expectancy. This demonstrates that the pandemic has not only influenced how healthcare professionals perceive the possible benefits of telemedicine to enhance their performance, but also how they perceive the ease of using telemedicine in their role. A study by Assaye et al. (2023) found that 60.9% of professionals had a positive perception of telemedicine, which proven to be beneficial in providing healthcare services to people during the pandemic. However, in a very short period, healthcare professionals were suddenly required to acquire the skills to utilize several telemedicine systems with little or no training (Bártlová et al., 2023).

In *limited observational capacity*, limitations arise during the adoption of telemedicine for healthcare professionals. Unlike face-to-face consultations, telemedicine consultations have limitations in terms of the healthcare professionals' ability to observe gestures and non-verbal communication. During online consultation, healthcare professionals are limited to seeing only the visible body parts and gestures of the patients displayed on the screen. The full-body appearance will not be able to be observed. However, it is an essential part of the assessment of the healthcare professionals of the patients. Previous research shows that despite the usage of video features, psychologists still need to put more effort into interpreting emotions due to factors like face position, gestures, hand activity, and other crucial indicators of the patients (Geraldina et al., 2023). The limited observational capacity in telemedicine will be more complicated if the patient decides to use the chat or voice call feature because healthcare professionals cannot analyse any gestures from the patient. In terms of *accessibility*, the perceived benefits of telemedicine align with research by Putri et al. (2021)

that online services function as a bridge between people and mental health services, providing a secure and accessible form of mental health care.

Another factor that is *lack of telemedicine courses in formal education* led to a lack of knowledge among healthcare professionals regarding telemedicine practices upon graduation from university. Orsolini et al. (2021) confirms this concern, stating that approximately 49.5% of psychiatrists have never been taught about telepsychiatry throughout their psychiatry course at their university. According to their research, 45.8% of respondents believe that a course on the adoption of digital psychiatry is extremely significant, while the remaining 35.9% believe it is moderately important (Orsolini et al., 2021).

A large percentage demonstrates the significance of including telemedicine information for depression in formal education. The lack of knowledge will also have an impact on healthcare professionals' capacity to adjust to the usage of telemedicine in the workplace. The lack of knowledge is also linked to learning time, with those who were trained in delivering digital treatments reported being more prepared and likely to use them in their clinical practice (Orsolini et al., 2021). Additionally, research by Assaye et al. (2023) showed that healthcare professionals who received information and communication technology (ICT) training demonstrated a favorable perception of telemedicine.

The next factor comes from *time limitation*. Due to time limitations, healthcare professionals have to ensure that the treatment they give is sufficient in a short amount of time. When healthcare professionals utilize a telemedicine application, the counseling session will automatically terminate once the allocated time has been reached. This finding relates to the previous research that analysed how patients who use chat feature are usually in a rush because of this time limitation; they are only seeking for a quick solution to their problems and do not want to discuss more details with the psychologist (Geraldina et al., 2023).

The interview results expand the research of Putri et al. (2021) and Orsolini et al. (2021) by building on their findings and offering a more detailed analysis of the regulatory landscape. Three factors related to rules and regulations were identified during the interviews. These factors are the *enforcement of ethical codes*, the *lack of formal regulations*, and the *lack of standardized psychoeducation materials*. In ethical codes, healthcare professionals are obligated to adhere to the ethical rules of their professions. This also affects the way they use telemedicine to treat the patients. The necessity to improve the enforcement of ethical principles is justified by the absence of legal rules related to telemedicine in Indonesia, including the ethical codes in conducting consultation through telemedicine. Government regulations are essential to ensure the proper governance of telemedicine in Indonesia, and to define the roles and responsibilities of healthcare professionals when they provide care to the patients.

The current regulations for telemedicine in Indonesia are deemed inadequate for providing comprehensive depression care. At present, Indonesia does not have any explicit regulations related to telemedicine. The existing telemedicine processes have not yet followed the Indonesian Mental Health Act (2014), which categorizes mental health care into four different stages: promotive, preventive, curative, and rehabilitative. Current telemedicine practices primarily emphasize the curative phase, aiming to facilitate patient recovery and reduce suffering, while the remaining three stages receive inadequate attention.

The existing laws implemented by the association of psychologists and psychiatrists have further added the issues in this scenario. The existing ethical standards of the associations do not explicitly address the ethical guidelines for telemedicine practices. There is a lack of information regarding the specific methods that psychologists or psychiatrists should employ while utilizing technology in depression care. This has caused confusion among psychologists and psychiatrists when they are required to use it in their role. The interviews confirm this

finding, where interviewee D as psychologists stated that telemedicine lacks centralized ethical codes by the Association of Psychologists and Psychiatrists.

Finally, the improvement of regulations and ethical conduct in the current health system is needed to ensure that patients with depression can be treated. Putri et al. (2021) emphasized the necessity of enhancing mental health policy, stating that doing so can help to close the mental health care provision gap in Indonesia. To improve depression care in Indonesia, telemedicine practices would need to include promotive, preventive, curative, and rehabilitative stages. Furthermore, integrating Universal Health Care into telemedicine practice could enhance depression care, where patients are able to use this insurance to consult with psychologists or psychiatrists. To ensure that telemedicine procedures perform as intended, ethical code of conduct in the implementation of telemedicine must be created and enforced.

7.2 Critical Reflection on UTAUT Framework

There is still a lack of numbers in qualitative research that explores the adoption of technology within the UTAUT framework of mental health research in Indonesia. This highlights the need for more qualitative research in the mental health sector to enrich the understanding of technology adoption beyond what is currently being done. The usability of performance expectancy and effort expectancy in the research of telemedicine adoption in depression care provides different arguments. In performance expectancy, the five different subconstructs, which are the perceived usefulness, extrinsic motivation, job fit, relative advantage, and outcome expectations, are sufficient to classify the adoption of telemedicine for depression care. However, from Table 13, it can be concluded that different subconstructs have different weights of factors, with perceived usefulness has 19.7% of all the total factors, extrinsic motivation has 6.6%, job-fit at 23.5%, relative advantage at 28.4%, and outcomes expectations with 21.9%.

Based on the data, it can be concluded that extrinsic motivation has a relatively minor impact on healthcare professionals' decisions to use telemedicine in terms of performance expectancy. There are a few external factors driving them to adopt telemedicine in their roles. In contrast, intrinsic motivation appears to have a bigger impact on the willingness to implement this technology. This finding is consistent with prior studies on technology adoption, which suggest that intrinsic motivation has a greater influence on the intention to utilize a technology than external motivation (Kim et al., 2021). This observation implies that each individual subconstruct within the performance expectancy in UTAUT may have varying weights and effects in relation to the technology adoption.

In effort expectancy, Venkatesh (2003) divides the subconstruct of effort expectancy into perceived ease of use, complexity, and ease of use. However, referring to Table 4 regarding the subconstructs and definitions of effort expectancy, it is challenging to differentiate between subconstruct of perceived ease of use, complexity, and ease of use in effort expectancy. This is particularly evident in qualitative analysis due to the absence of a clear threshold for determining the level of difficulty in using the technology. This demands the adjustment of these subconstructs into a single, comprehensive construct of *perceived ease of use* in qualitative research. The interviewees' personal perceptions of the difficulty level of telemedicine adaptation may also contribute to bias when using the original subconstructs of effort expectancy in qualitative analysis.

Additionally, the original subconstructs of effort expectancy may be more suitable to use in quantitative research, where the subconstructs of effort expectancy can be properly utilized by conducting surveys using tools such as the Likert scale. This allows for an evaluation of the differences between *perceived ease of use*, *complexity*, and *ease of use* by employing specific thresholds for each subconstruct.

7.3 Summary of the Chapter

The findings presented in this chapter demonstrate the connections between this study and the prior research. The analysis reveals that the challenges faced by healthcare professionals during the interview have also been examined in the previous study. Pandemic-driven adoption is the only factor that appears in both performance and effort expectancy, indicating that the pandemic influences how healthcare professionals view the benefits and ease of use of telemedicine in their roles. Previous research validated the interviews' findings by demonstrating that *limited observational capacity* influences the role of healthcare professionals in providing care to patients. Telemedicine could also enhance the *accessibility* of the care for patients.

In terms of effort expectancy, *lack of telemedicine courses in formal education* led to lack of healthcare professionals' knowledge toward the telemedicine usage. The time constraint has a significant impact on healthcare professionals, as they are required to adapt their care delivery within a limited timeframe, where consultations may be hurriedly completed due to these circumstances.

Additionally, three factors in effort expectancy are found related to the regulations, these are *enforcement of ethical codes*, the *lack of formal regulations*, and the *lack of standardized psychoeducation materials.* The previous research indicates an absence of adequate laws regarding telemedicine practices in mental health, highlighting the need for significant improvements in the existing regulations established by the Indonesian government.

8 Conclusions

This chapter provides conclusions toward the main research questions, future research that may be conducted, and the relevance of this research to the CoSEM Programme. A summary of results to the sub-research questions is provided to help summarize the findings.

8.1 Answer to the Main Research Question

The main research question for this research is as follow:

How can the adoption of telemedicine for depression care be facilitated among healthcare professionals in Indonesia?

The analysis of interviews reveals that there are two additional contributors influencing the adoption of telemedicine for depression care in Indonesia in addition to the current framework of UTAUT, these are education and technology domain. Figure 12 visualizes these findings.

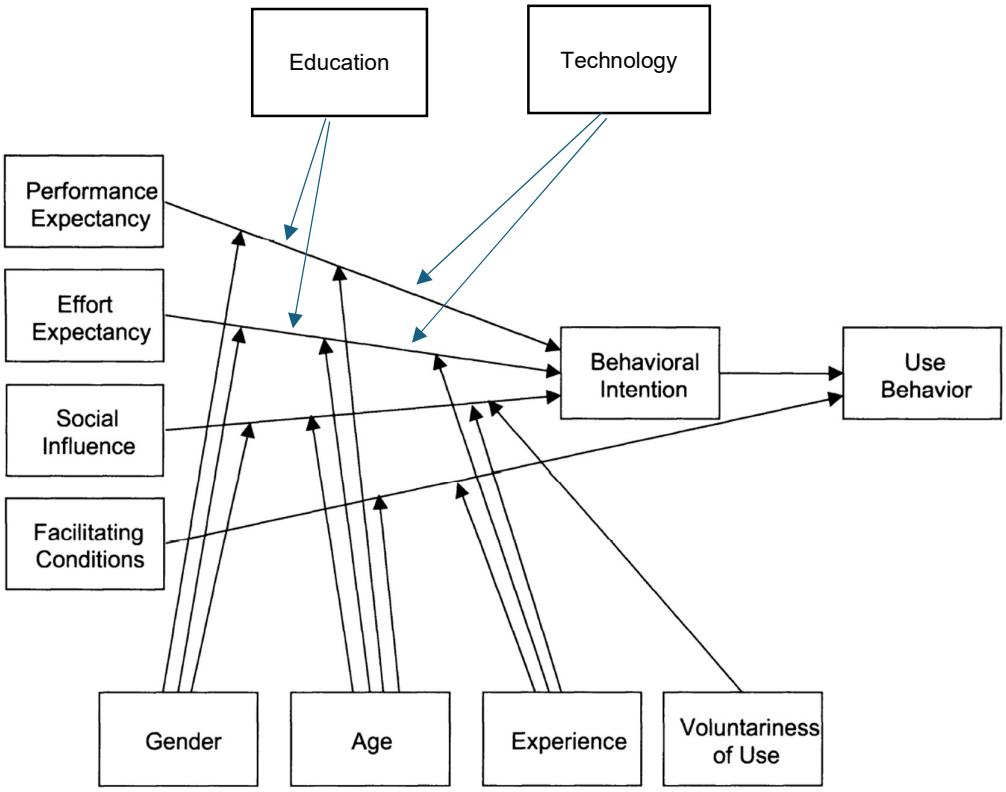


Figure 12. UTAUT Framework for Adoption of Telemedicine in Depression Care

To arrive at this conclusion, this research utilizes three sub-research questions as follows:

1. *How is telemedicine used for depression care in Indonesia?*
2. *How does the use of telemedicine impact healthcare professionals' roles for delivering depression care in Indonesia?*

3. *How do healthcare professionals perceive the ease of use of telemedicine for treating depression care in Indonesia?*
4. *How do factors related to the use of telemedicine among healthcare professionals contribute to the adoption of telemedicine for depression care in Indonesia?*

To understand the way telemedicine can be adopted, adoption factors in performance expectancy and effort expectancy are looked for. Performance expectancy is divided into five subconstructs: perceived usefulness, extrinsic motivation, job-git, relative advantage, and outcome expectations, whereas effort expectancy is only used one subconstruct called perceived ease of use.

Within the constructs studied in this thesis (performance expectancy and effort expectancy), a number of critical factors contributing to adoption of telemedicine in Indonesia were found. The interview analysis shows that 18 factors are identified as the performance expectancy factors, with nine of them are considered the key factors: *improve patient care*, *expand patient reach*, *pandemic-driven adoption, feature suitability, limited observational capacity, accessibility, flexibility, improve healthcare professionals' knowledge*, and *patient re-engagement*. In effort expectancy, five key factors are identified from a total of 13 factors that affect the adjustment needed by healthcare professionals to use telemedicine in their role. These key factors are *lack of telemedicine courses in formal education*, *availability of technical guidance*, *pandemic-driven adoption*, *time limitation*, and *training availability*. These key factors are critical to making the transition to telemedicine faster in the healthcare professionals' role in depression care.

Additionally, three factors related to regulations are found in effort expectancy. These factors are *enforcement of ethical codes*, *lack of formal regulations*, *and lack of standardized psychoeducation materials*. These factors support the initial analysis that Indonesia lack of telemedicine regulations, and this hinder the adoption of telemedicine among the healthcare professionals in the depression care.

Analysis of the current state of depression care in Indonesia indicates that the Indonesian government has begun to notice mental health issues. The establishment of the Indonesian Mental Health Act in 2014 and Health Law No. 17/2023 demonstrates this point. The Indonesian Association of Psychiatrists and Psychologists has already established a code of conduct to assist healthcare professionals in providing counseling for the patients. However, no regulations related to telemedicine for depression care are in place, making it harder for healthcare professionals to define the ethical codes that must be employed when they use this technology in their role.

Critical reflection towards the UTAUT framework shows that between the five subconstructs in performance expectancy, extrinsic motivation has the less impact towards the adoption. This shows that the subconstructs of this framework may have different weight and impact towards the adoption of telemedicine. In the context of effort expectancy, critics highlight the challenges associated with separating the three original subconstructs of perceived ease of use, complexity, and ease of use. These subconstructs are often more relevant for quantitative studies, where clear thresholds can be established to differentiate between them.

8.2 Policy Recommendations

The findings of this research indicate that improvements could be made to increase the adoption of telemedicine for depression care in Indonesia by implementing several actions in institutional and technological settings. The institutional responsibilities are divided among the government, associations, and academic institutions, while the technological settings are covered by the technology providers.

To address the relevant challenges mentioned in the analysis, the first potential solution is from the institutional setting where academic institutions and the government can integrate telemedicine knowledge into university curriculum. During their practical work, healthcare professionals should have the opportunity to engage in telemedicine practice, thereby gaining practical knowledge to utilize this technology in their roles. This will benefit how healthcare professionals perceive the use of this technology and allow healthcare professionals to adapt to telemedicine faster when they use it in their jobs.

The second improvement is intended for technology providers. From a technological perspective, technology providers must be able to build features based on the needs of their users, including patients and healthcare professionals. Important features, such as the availability to choose their preferences regarding the time limitations need to be added. To solve the time limitations issue, the technology providers can let the patient or healthcare professionals decide their preferred counseling time limitation. Telemedicine providers should be able to allow patients to decide how long they want to consult. On the other hand, healthcare professionals should be able to specify their preferred counseling time that they believe will be sufficient for the therapies. Additionally, healthcare professionals must be able to know the patients' real name and location to avoid unwanted behavior of the patients. Several additional features, such as mood tracker and activity tracker, will enable them to enhance their counseling services to patients

In an institutional setting, the government and associations of healthcare professionals should employ comprehensive regulations related to the use of telemedicine for depression care in Indonesia. This includes the integration of Universal Health Care to be able to use in telemedicine by the patients and the integration of depression care stages such as the promotive, preventive, curative, and rehabilitative stages to telemedicine. A clause concerning the ethical rules for conducting telemedicine practices should also be added to the association of psychologists and psychiatrists' code of conduct. This is to ensure that healthcare professionals will be able to employ the technology while still following its ethical considerations.

8.3 Academic Contributions

The research gaps show that there are gaps in understanding about the factors that influence healthcare professionals to use telemedicine in Indonesia in their role. To fulfill this goal, UTAUT framework is employed by considering the performance and effort expectancy constructs.

First, this research can provide guidelines for understanding telemedicine for depression care from the healthcare professionals' perspective. Research about telemedicine in Indonesia primarily focuses on the patient's perspective such as research by Arjadi et al. (2018), Hartini et al. (2023), and Brooks et al. (2023); however, healthcare professionals, who are also telemedicine users, must also be taken into account when practicing telemedicine. This research attempts to address the lack of research on telemedicine among healthcare professionals.

Second, this study seeks to identify the factors that influence healthcare professionals' decisions to employ telemedicine. While Lemon et al. (2024) highlighted the importance of digital health for mental health care, the study did not investigate the specific aspects influencing technology adoption. Additionally, previous studies, such as Geraldina et al. (2023), have explored the challenges of telemedicine, and this research seeks to identify adoption factors that contribute to these challenges through the UTAUT framework and suggest improvements of it. This research also builds on the work of Shania et al. (2023) and Muzdalifah & Markam (2023) to gain a better understanding of the telemedicine adoption. Shania et al. (2023) explored the development of mHealth interventions for addressing

depression, while Muzdalifah & Markam (2023) assessed the readiness level for telepsychiatry, both considering the perspectives of healthcare professionals. This research seeks to increase understanding of what makes adoption of telemedicine in depression care successful by examining the factors that influence healthcare professionals' use of telemedicine.

The third contribution is to understand how telemedicine for depression care might be implemented in a specific nation, in this case, Indonesia. This is to address the knowledge gaps identified by Dowrick et al. (2020) that digital technology research must consider the local context, in this case Indonesia.

The fourth contribution is understanding about the regulatory implications towards the telemedicine practices for depression care in Indonesia for the healthcare professionals. This is to improves the research by Putri et al. (2021) and Orsolini et al. (2021) by building on their findings of the regulatory landscape.

The fifth contribution is an understanding of the UTAUT framework in qualitative research. There is still a lack of numbers in qualitative research that explores the adoption of technology within this framework. This highlights the need for more qualitative research to enrich the understanding of technology adoption beyond what is currently being done. While the subconstructs in performance expectancy are sufficient for the analysis of UTAUT in qualitative research, it differs in effort expectancy. The current subconstruct of effort expectancy is not well-suited for qualitative research, necessitating its adjustment into a single, comprehensive construct of perceived ease of use in qualitative research. The original subconstructs of effort expectancy may be more suitable to use in quantitative research, where the subconstructs of effort expectancy can be properly utilized by employing specific thresholds for perceived ease of use, complexity, and ease of use as the UTAUT's original subconstruct.

8.4 Limitations

This research focuses exclusively on depression care in Indonesia as a country, without particularly examining the adoption factors in certain provinces or regions of Indonesia. The lack of data and research on Indonesia's health systems hinders the analysis in this thesis. The interviewees were contacted by LinkedIn, indicating that they are people who use this platform in their professional capacity. Nevertheless, the search results may exclude healthcare professionals in low-resource areas who are not using this platform for their jobs.

UTAUT, the theoretical foundation of this research, expects that performance expectancy will be influenced by gender and age, with the effect being stronger for men, especially for younger men (Venkatesh et al., 2003). In addition, the effort expectancy will be influenced by gender, age, and experience, where the effect will feel stronger in women, especially young women and those in the early stages of the experience (Venkatesh et al., 2003). However, the analysis of the adoption of telemedicine in this research does not take into account gender, age, and stages of experience due to the constraints of the number of interviewees. The similar ages and levels of experience among the interviewees pose a challenge in analyzing this aspect. In addition, of the ten healthcare professionals, just one is male, which indicates that including gender in the analysis would not provide a thorough result.

In the context of methodology, qualitative research may involve bias in the analysis. The bias may stem from the researcher's personal understanding of its social and cultural context, since the writer has been living in the designated country and is a member of the population that will be impacted by this research. To mitigate the bias, the interviewees being interviewed were selected from sources outside of the researcher's social network, and the analysis was based on the findings from the interviews and relevant literature. The coding process in the atlas.ti

may also lead to bias in the analysis. Both inductive and deductive coding techniques were employed to ensure a comprehensive analysis from both coding perspectives.

8.5 Future Research

For future research, it is advisable to explore the range of residency areas, gender, age, and experience of the interviewees as criteria for selecting participants. This would contribute to a more comprehensive and in-depth analysis, which would explain the impact of these factors on the performance expectancy and effort expectancy of healthcare professionals who utilize telemedicine for depression in their respective roles. To mitigate the bias of analysis in atlas.ti, the validity process in future research can be conducted using the triangulation method. Additionally, peer review can be utilized during the coding process to eliminate any potential bias that the researcher may have when analysing the research.

Additionally, the balance of psychologists and psychiatrists can be considered, so the analysis would offer a deeper understanding of the factors that contribute to each healthcare professional's role. This will enable a more thorough examination of the adoption of telemedicine for depression care, as the similarities and differences between each respective role can be highlighted.

This research provides additional suggestions and critiques towards the UTAUT framework for telemedicine adoption of depression care in Indonesia by adding the domain of education and technology as contributors that affected the telemedicine adoption. Future research can be conducted to ensure the validity of these findings and further analyse the generalization of the suggested framework to be employed in similar cases in different countries.

The next recommendation is derived from unexamined analysis in this research. Analysis of how to incorporate telemedicine into the current healthcare system of a mental health hospital might be interesting to analyse. Multiple hospitals in Indonesia have decided to create their telemedicine application to meet their specific requirements and its integration for creating an integrated telemedicine system in Indonesia would be intriguing,

8.6 Relevance with CoSEM Programme

This research aligns with the master's program in Complex Systems Engineering and Management because the complex systems approach is adopted to solve sociotechnical issues. This research employs UTAUT as the main theoretical framework to explore and understand the adoption of technology in telemedicine, with considering the performance and effort expectancy as two of the main constructs.

Moreover, this research integrates perspectives from the healthcare professionals as the main stakeholder to better understand the adoption. Through multidisciplinary approach, this research seeks to provide a comprehensive understanding of the key factors related to adoption of telemedicine in for depression care in Indonesia from the perspective of healthcare professionals. It aims to provide practical ideas for improving telemedicine practices, assuring the improvement of depression care for patients in Indonesia.

Policy recommendations are added, both in technological and institutional perspectives. In an institutional setting, this research investigates the influence of current policies on depression care and the utilization of telemedicine. The analysis of technological perspectives is conducted to have a better understanding of the capabilities and limitations of telemedicine that affect the adoption.

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APPENDIX

APPENDIX A – Search Methodology

Search methodology was employed by using keywords and applying filters for the literature. The workflow for the search method is shown in Figure 13.

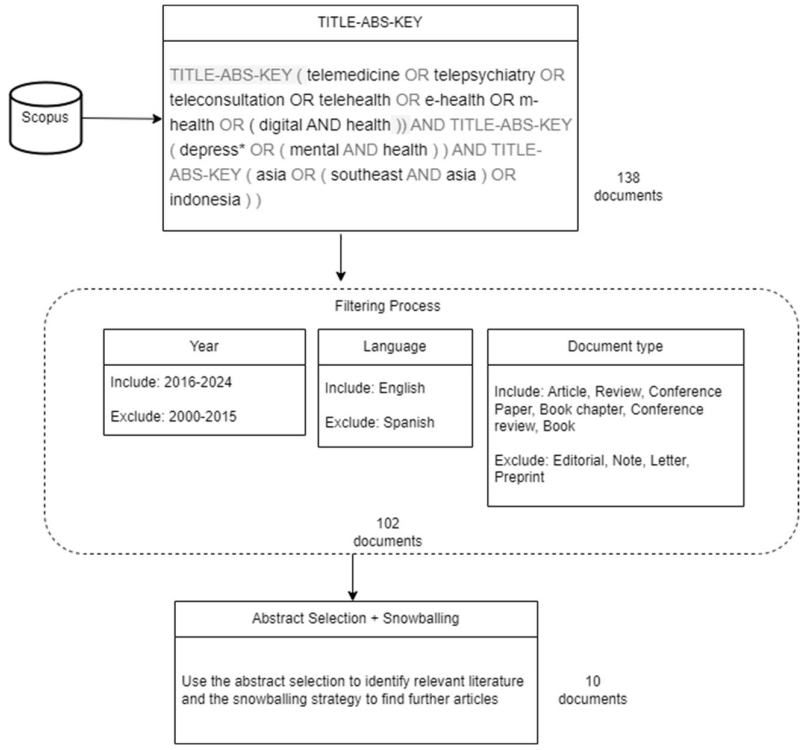

Figure 13. Searching method

The keywords and its filter can be seen in Table 15.

Table 15. List of Query to Find Relevant Articles

Filter	Query	Number of articles
Basic query	(TITLE-ABS-KEY (telemedicine OR telepsychiatry OR teleconsultation OR telehealth OR e-health OR m-health OR (digital AND health)) AND TITLE-ABS-KEY (depress* OR (mental AND health)) AND TITLE-ABS-KEY (asia OR (southeast AND asia) OR indonesia))	138

Filter	Query	Number of articles
Year 2016-2024	(TITLE-ABS-KEY (telemedicine OR telepsychiatry OR teleconsultation OR telehealth OR e-health OR m-health OR (digital AND health)) AND TITLE-ABS-KEY (depress* OR (mental AND health)) AND TITLE-ABS-KEY (asia OR (southeast AND asia) OR indonesia)) AND PUBYEAR > 2015 AND PUBYEAR < 2025	123
Exclude Spanish article	(TITLE-ABS-KEY (telemedicine OR telepsychiatry OR teleconsultation OR telehealth OR e-health OR m-health OR (digital AND health)) AND TITLE-ABS-KEY (depress* OR (mental AND health)) AND TITLE-ABS-KEY (asia OR (southeast AND asia) OR indonesia)) AND PUBYEAR > 2015 AND PUBYEAR < 2025 AND (EXCLUDE (LANGUAGE , "Spanish"))	122
Exclude editorial, note, letter, retracted, and preprint article	(TITLE-ABS-KEY (telemedicine OR telepsychiatry OR teleconsultation OR telehealth OR e-health OR m-health OR (digital AND health)) AND TITLE-ABS-KEY (depress* OR (mental AND health)) AND TITLE-ABS-KEY (asia OR (southeast AND asia) OR indonesia)) AND PUBYEAR > 2015 AND PUBYEAR < 2025 AND (EXCLUDE (LANGUAGE , "Spanish")) AND (EXCLUDE (DOCTYPE , "le") OR EXCLUDE (DOCTYPE , "no") OR EXCLUDE (DOCTYPE , "ed") OR EXCLUDE (DOCTYPE , "tb") OR EXCLUDE (DOCTYPE , "pp"))	102
Manual review through abstract selection and snowballing technique to find relevant articles in telemedicine for depression care in Indonesia	(TITLE-ABS-KEY (telemedicine OR telepsychiatry OR teleconsultation OR telehealth OR e-health OR m-health OR (digital AND health)) AND TITLE-ABS-KEY (depress* OR (mental AND health)) AND TITLE-ABS-KEY (asia OR (southeast AND asia) OR indonesia)) AND PUBYEAR > 2015 AND PUBYEAR < 2025 AND (EXCLUDE (LANGUAGE , "Spanish")) AND (EXCLUDE (DOCTYPE , "le") OR EXCLUDE (DOCTYPE , "no") OR EXCLUDE (DOCTYPE , "ed") OR EXCLUDE (DOCTYPE , "tb") OR EXCLUDE (DOCTYPE , "pp"))	10

APPENDIX B – Articles for Knowledge Gaps

Table 16. Articles for Knowledge Gaps

No.	Article	Source
1	Lemon et al. (2024)	Keyword Scopus
2	Brooks et al. (2023)	Keyword Scopus
3	Shania et al. (2023)	Keyword Scopus
4	Orsolini et al. (2021)	Keyword Scopus
5	Putri et al. (2021)	Keyword Scopus
6	Arjadi et al. (2018)	Snowballing
7	Geraldina et al. (2023)	Snowballing
8	Hartini et al. (2023)	Snowballing
9	Muzdalifah & Markam (2023)	Snowballing
10	Dowrick et al. (2020)	Snowballing

APPENDIX C - Informed Consent

You are being invited to participate in a research study about innovation of telemedicine for depression care in Indonesia. This study is conducted by Rezzy Yolanda Wulandhari, an MSc student in Complex Systems Engineering and Management at Delft University of Technology, the Netherlands. This research is conducted under the supervision of Saba Hinrichs-Krapels.

I will ask you to provide information related to your opinion in regards of telemedicine practices, especially in depression care. The data collected through this interview will remain confidential and will be stored on an institutional storage at TU Delft, accessible only to the research team. The interview will include a video/audio recording and the transcription of the discussion. The interview results included in the master's thesis will be aggregated and anonymous. The Master thesis will be publicly available at the end of this project. All personal data (recording, transcript, proof of consent) will be preserved at TUD for up to 4 years (~ Sept. 2028) after the completion of the results. The data may be reused for future research or education in the domain of innovation in the healthcare domain. You will be anonymous in any and all following publication.

In case you would like the data to be deleted, review, or retracted, please contact the responsible researcher.

The contact details of the researchers are as follows.

Corresponding Researcher
Rezzy Yolanda Wulandhari

Responsible Researcher
Saba Hinrichs-Krapels

_____

I agree that my responses, views or other input can be quoted anonymously in research outputs	Yes ☐	No ☐

Signatures

_____	_____	_____
Name of participant	Signature	Date

Study contact details for further information:

Rezzy Yolanda Wulandhari

RezzyYolandaWulandhari@student.tudelft.nl

APPENDIX D – Interview Questions

Interview questions can be seen in Table 17.

Table 17. Interview questions

For healthcare professionals	For academics
1. Can you share your experience when using telemedicine in your role? Sub-question: - How do you see the difference in your role before and after you started using telemedicine?	*1.* How do you think the use of telemedicine has affected the treatment of depression in Indonesia compared to before?
2. What influenced your decision to use telemedicine?	
PERFORMANCE EXPECTANCY	**PERFORMANCE EXPECTANCY**
3. In your role as psychologist/psychiatrist, could telemedicine make a difference to treating depression? If so, how? If not, why not?	2. How can telemedicine make a difference to the way depression care is provided in Indonesia?
4. Does telemedicine help you achieve your aims as a psychologist/psychiatrist? If so, how so? If not, why not?	3. Could anything be improved in the way telemedicine is currently used for depression care? Please explain.
5. Could anything be improved in the way telemedicine is currently used for depression care in your role? Please explain.	
EFFORT EXPECTANCY	**EFFORT EXPECTANCY**
6. How do you adapt when you start using the telemedicine for your role?	*4. (If they did research on this topic)* What in your opinion is the learning required by professionals in Indonesia for adopting telemedicine? *Or* What type of training or support is necessary for healthcare professionals to be able to use telemedicine in their role?

For healthcare professionals	For academics
7. Could you describe when you first started using telemedicine? Sub-question: - How much effort did you have to put in to be able to employ it in your daily job?	5. *(If they are also lecturer(s) in their programme/university)* Does your university/program have course on telemedicine practices? If yes, please explain. If no, why this is not part of the teaching materials?
8. What type of training or support is necessary for you to be able to use telemedicine in your role? Sub-questions: - Which training or support is currently provided by the telemedicine app? - What can be improved from the current training or support?	
ADDITIONAL INFORMATION	**ADDITIONAL INFORMATION**
9. What considerations must be taken into account when adapting telemedicine for depression care in Indonesia?	6. What considerations must be taken into account when adapting telemedicine for depression care in Indonesia?
	7. Questions related to the articles that they published.