A Review and Conceptual Development of Factors Influencing Patients' Satisfaction of Telemedicine and Their Preference Post the Pandemic Era

Shafina Ghazani Erlangga (000000[redacted])
MBAHM[redacted]

Index

1. Introduction 3
2. Problem Statement 5
3. Research Questions and Objective 6
4. Literature Review 7
   Expectation Disconfirmation Theory (EDT) 8
   Telehealth Usability Questionnaire (TUQ) 8
   Technology Acceptance Model (TAM) 9
   SERVQUAL 9
5. Research Methodology 10
6. Findings and Conceptual Model Development 10
   a. Patient satisfaction and patient preference 12
   b. Technological aspect 13
   c. Accessibility 13
   d. Perceived Usefulness 14
   e. Service Quality 14
   f. Similarity to Face-to-Face Interaction 15
   g. Convenience 15
7. Conclusion 15
References 17

1. Introduction

The term Telemedicine is no longer foreign to most people. Computers being at the center of modern communication since the advancement of the internet, has played a key role in the development of network technology. As the internet expands its capabilities along with digitalisation, computerised machines and devices (e.g., mobile phones, wearables, etc.) are becoming more accessible and can be operated (e.g., through mobile applications) by anyone. [redacted] (2).

Mentioned often in conjunction with the development of Information and Communication Technology (ICT) in healthcare, telemedicine is a form of healthcare delivery under the Telehealth umbrella (see Fig. 1) that offers remote clinical services in the areas of diagnostics, treatment, prevention and rehabilitation as well as medical decision-making advice(3, 4). This mainly involves the measurement, collection, and transmission of information or the application of medical procedures by means of ICT between doctors or between doctors and patients(5).

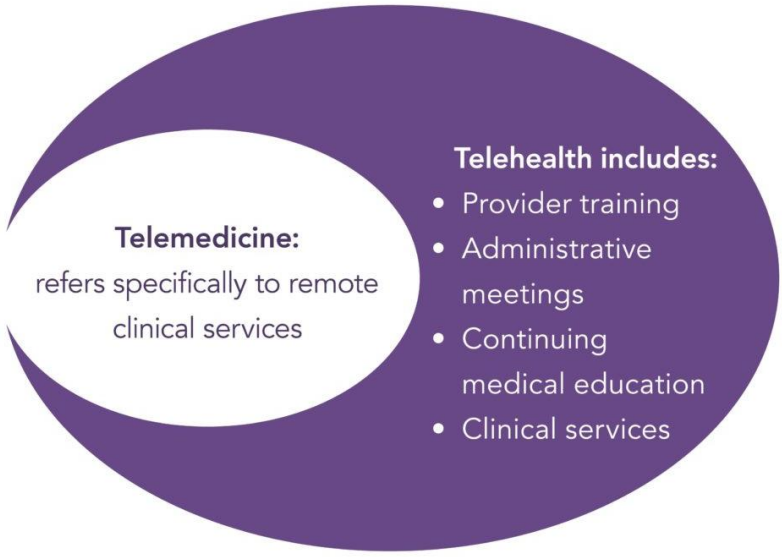

Figure 1 Telehealth-Telemedicine Definition
SOURCE: Health Resources and Services Administration, courtesy of Texas Health Improvement Network.

[redacted](2). So, the infrastructure for telemedicine has been around for a while and the need to adopt telemedicine has been stressed by industry players for years, but because of lack of awareness and infrastructure the progress and implementation has been put stagnant. However, the urgency that emerged, when the World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) outbreak as a pandemic on March 11th, 2020, has accelerated the development and implementation of telemedicine internationally(6-8).

Before COVID-19, telemedicine was offered on a limited basis, mostly for patients who lived in rural areas and had trouble going to medical facilities. And it has started showing growing interest and has proven helpful. [redacted].

[redacted]Some private hospitals, private companies, also government-funded healthcare providers started applying the technology of telemedicine and provided their patients with a more accessible way to get in touch with the doctors during the very strict contact restriction. The form of telemedicine used for primary care is usually given via phone or video calls or even chat, doctors could give patients guidance for non-emergency medical issues that don't require them to see the patients in person.

[redacted]

[redacted](9, 10). In order to stop the spread of the virus, telemedicine is the best method for minimising patient transfer to hospitals and allocating hospital resources to situations that are more critical. It offers the alternative for providing healthcare to patients during the pandemic and bridging the gap between people, doctors, and healthcare systems. The Malaysian government also has made the MySejahtera and MyTrace apps available as an attempt to battle the spread of the virus through contact tracing.

After struggling to gain attraction prior to the pandemic, Malaysian private healthcare providers discovered a new potential for growth of telemedicine. [redacted](6). [redacted](1, 11).

2. Problem Statement

Since many patients postponed and/or were declined in-person visits due to the COVID-19 pandemic's rapid spread, there was a marked increase in the demand for telemedicine solutions. For consultations to discuss diagnoses and treatment options with patients in non-critical cases, hospitals and clinics all around the world have moved to videoconferencing. The United State of America's Department of Health and Human Services said that a 63-fold increase was made in the number of telehealth visits, from 840,000 in 2019 to 52.7 million in 2020(12, 13). Numerous telehealth businesses noticed an increase in demand for their services as a result of the travel limitations brought on by the pandemic. For instance, [redacted](14). [redacted]

[redacted](15).

However, now that the pandemic urgency is almost over, the world opens again. People can now almost go back to the previous ways of doing things. But the economy began to recover, the growth rate has begun to slow down in 2022. [redacted].

Most of previous studies have resulted high satisfaction rate of the use of telemedicine during COVID-19, both patients' and doctors'(16-20). [redacted].

The telemedicine market was overall positively impacted by the COVID-19 pandemic. It raised awareness of telemedicine options, showed the capability of people in adapting to the new technology, and it raised market investment activity. So, noticing the slowing down of telemedicine market growth in 2022, it is essential for the continuity of it, to monitor the trend of health care through the patients' satisfaction level and preference, and to discover what factors affect them.

3. Research Questions and Objective

As Telemedicine became very convenient and was highly used during COVID-19 worst phase when it wasn't recommended to go outside because of the diseases, the continuation of

telemedicine usage past the pandemic is questioned. The paper is going to be conceptualizing the study on the satisfaction rate of patients of their experience with telemedicine and to see whether they have the intention to use this form of healthcare service in the future, post the pandemic phase in Malaysia. The research questions would be:

- [redacted]?
- [redacted]?
- [redacted]?

The objective of this conceptual paper would be to determine the most used factors and methods in studying patients' satisfaction and preference of telemedicine and develop hypotheses and a conceptual framework for the empirical study.

4. Research Significance

[redacted].

5. Literature Review

Review of literatures of studies and articles related and relevant to the topic of this paper was conducted in order to gain insights of current situation and knowledge. This is a process of screening published articles on a specific subject with the objective to fully understand the topic and find the gap within those articles.

[redacted](21). Some studies suggest that patients' high

satisfaction rate is the result of decreased cost for health service through telemedicine and that they'd prefer in-person care when they have to pay out-of-pocket cost(18, 22).

Telemedicine is undoubtedly a very convenient tool that has helped maintain the progression of medical care during the pandemic. Convenience, efficiency, privacy, and comfort are described as important to consider when deciding between video visits and in-person visits(19, 22, 23). Those with stable internet connection had significantly higher satisfaction rates(16, 19), and technical problems are constantly mentioned in previous studies(24, 25).

Expectation Disconfirmation Theory (EDT)

The EDT model has also been applied to studies of patient satisfaction in the healthcare industry, including those involving medication-related services, surgical treatment outcomes, waiting times for surgery, emergency department services, and eHealth Website user, including telemedicine(26). [redacted].

Telehealth Usability Questionnaire (TUQ)

This questionnaire is used the most in articles for researching satisfaction on telemedicine(27). Parmanto et al. in 2016(28), formally introduced TUQ. The TUQ was created as a thorough questionnaire that addresses every aspect of usability, including usefulness, ease of use, effectiveness, reliability, and satisfaction. The term "usefulness" relates to how users believe a telehealth system operates in order to deliver a healthcare interaction or service that is comparable to a conventional in-person encounter(29). [redacted](30). Reliability refers to how easily the user can recover from an error and how the system

provides guidance to revert this error. Last factor covers the overall satisfaction of the user with the telehealth system and how willing the user would be to use the system in the future.

Technology Acceptance Model (TAM)

This model was presented by Davis in 1989(31). The primary factors influencing an individual's intention to use a new technology are perceived ease of use and perceived usefulness. This model's emphasis on the perceptions of the potential user is its defining characteristic. [redacted].

SERVQUAL

The SERVQUAL model is one of the best and most popular models for assessing service quality in the healthcare industry. The SERVQUAL technique seeks to comprehend how clients view service quality.

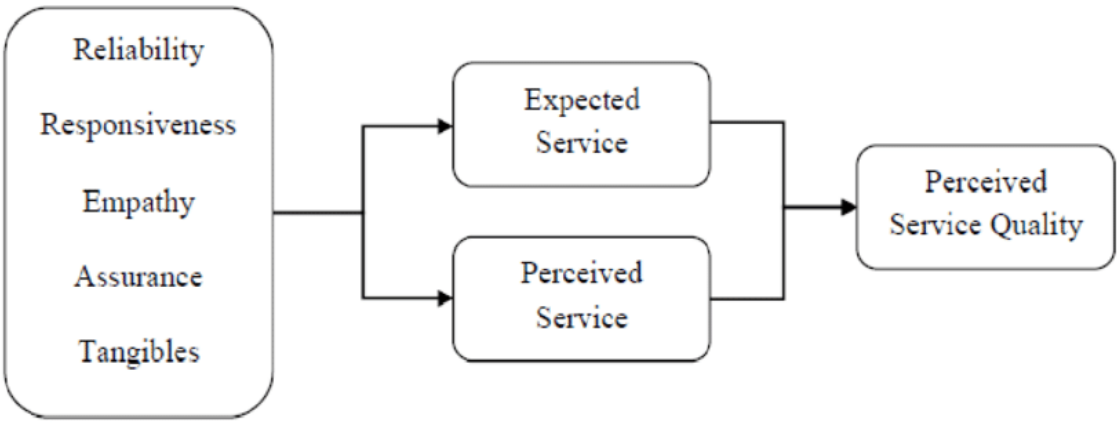

Figure 2 SERVQUAL Model (Parasuraman et al., 1988)

The level of expectation and performance of service quality is measured by five dimensions; tangibles, reliability, responsiveness, assurance, and empathy(33). [redacted]

[redacted] (33, 34).

6. Research Methodology

Review of previous literatures was done to determine the factors affecting and associated with patients' satisfaction and preference of telemedicine. Keywords used to search for the articles were telemedicine, satisfaction, preference, perception, COVID-19, and combinations of the words. The 24 articles were collected from PubMed, Elsevier, Research Gate, JAMA, and Google Scholar. The studies gathered were conducted between 2017 to 2022, but mostly were 2021 and 2022. [redacted].

Information from these articles was tabulated and organized in order to categorize the dependent, independent, moderating, and mediating variables. Method, data analysis, conclusion, limitation, and recommendation were included in the table. Three articles were excluded for irrelevance and other two because these don't observe patients' satisfaction as the dependent variable, resulting in 19 articles in total. The variables from the 19 articles were then sorted per frequency for the most frequent used factors in researching patients' satisfaction and preference. Another table was then made to further sort the categories.

7. Findings and Conceptual Model Development

The finding of this paper is the frequency analysis on the variables relevant and associated with patients' satisfaction and preference on telemedicine.

Variables	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	sum
Patient Satisfaction	x	x	x		x	x		x	x		x	x	x	x	x	x		x	x	x	x	x		x	19
Convenience		x				x		x	x	x		x	x	x	x			x		x	x	x	x	x	15
Technical Aspect								x		x	x	x	x	x	x			x	x	x		x	x	x	13
Patient Preference		x				x		x			x	x		x		x		x			x				9
Service Quality		x	x		x				x			x								x		x		x	8
Accessibility		x							x	x	x			x				x			x				7
Similarity to f2f Interaction					x			x										x			x			x	5
Perceived Usefulness	x		x						x					x											4
Intention of Use			x			x						x											x		4
Interaction Quality	x													x		x									3
Privacy Concern		x						x					x												3
Scheduling									x	x						x									3
Reliability	x													x											2
Ease of Use	x		x																						2
Patient-Physician Relationship													x			x									2
Type of Telemedicine					x				x																2
Internet Connection					x																		x		2
Education on Technology		x								x															2
Safety															x					x					2
Attitude									x																1
Availability																			x						1
Efficiency																				x					1
Usability												x													1
Interface Quality	x																								1
Confidentiality Concern		x																							1
Device Cost		x																							1
Communication bw. Staff		x																							1
Flexibility		x																							1
Job			x																						1
Usage Behaviour			x																						1
Gender					x																				1
Age						x																			1
Income						x																			1
Race						x																			1
Education Level						x																			1
Ease of Med. Report Transfer									x																1
Urgency										x															1
Physician Contribution											x														1
Missed Appointment Rate												x													1
Logistics																x									1

Table 1 Frequency Analysis
A= Article, f2f= Face-to-face

Out of the 24 articles screened, three articles were removed as they were deemed irrelevant to the topic, and thus, out of the remaining 21 articles, 40 variables were identified. Out of the 40, nine variables are highlighted as they each have a frequency of minimum four, therefore they are considered significant, as these were repeatedly found in the articles and thus indicate the importance of these factors in affecting the patients' satisfaction and preference (see Tab. 1).

All nine variables were then categorized per its' position in the respective articles; patients' satisfaction, preference, convenience, technical aspect, service quality, accessibility, similarity to face-to-face interaction, perceived usefulness, and intention of use. [redacted] (see Tab. 2).

	A1	A2	A3	A5	A6	A8	A9	A11	A12	A13	A14	A15	A16	A18	A19	A20	A21	A22	A24	I	Mo	Me
Patient Satisfaction	D	D	D	D	D	Me	D	D	D	D	Me	D	D	D	Me	D	D	D	D			3
Convenience		I			I	I	I		I	I	Mo	I		I		I	I	I	Mo	11	2	0
Technical Aspect						I		I	I	I	I	I		I	Mo	Mo		I	Mo	8	3	0
Patient Preference		D			D	D		D	D		D		D	D			D					
Service Quality		Mo	I	I			I		I							I		I	I	7	1	0
Accessibility		I					I	I			Mo			I			I			5	1	0
Similarity To F2F Interactic				I		I								I			I		I	5	0	0
Perceived Usefulness	I		I				I				I									4	0	0

Table 2 Significant Variables
A= Article, f2f= Face-to-face, D= Dependant variable, I= Independent variable, Mo= Moderating variable, Me= Mediating variable

And all the other six variables were deemed significant for the conceptual framework as independent variables: convenience, technical aspect, service quality, accessibility, similarity to face-to-face interaction, perceived usefulness, as more than four articles mentioned these variables. [redacted]. (see Fig. 2)

a. <u>Patient satisfaction and patient preference</u>

[redacted]

[redacted]

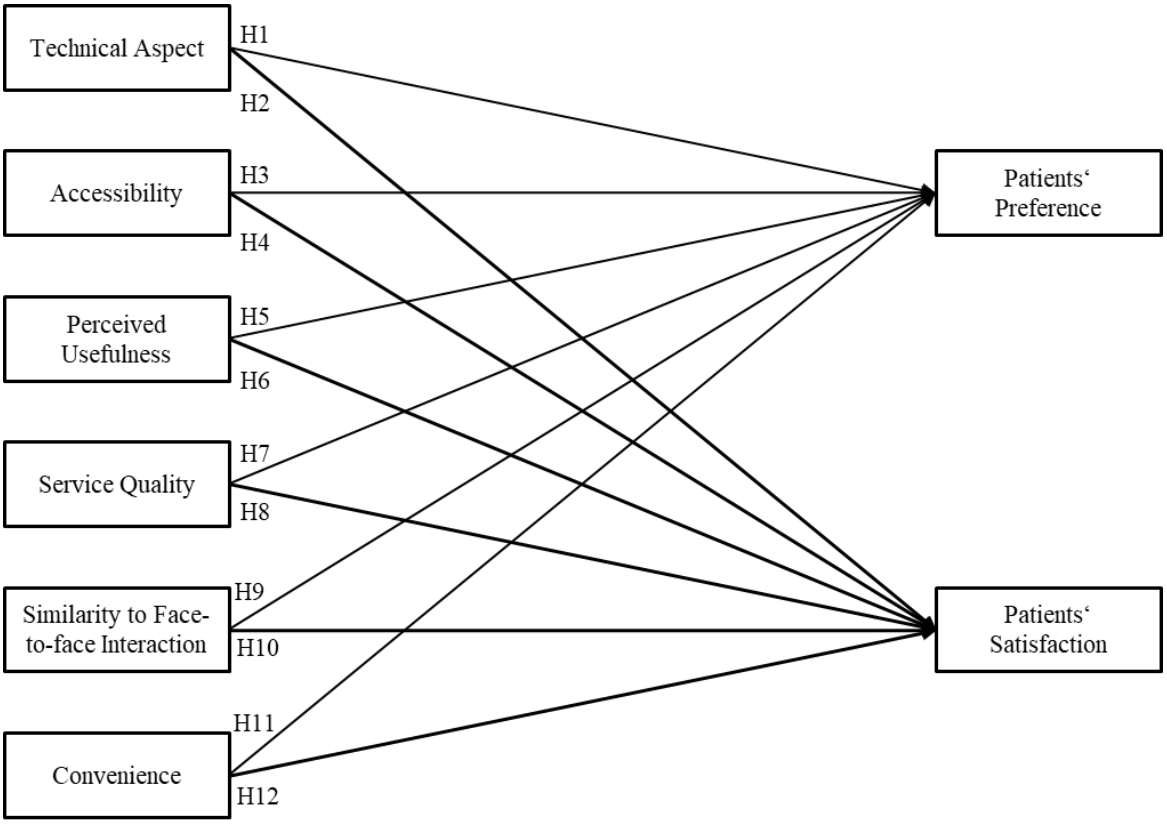

Figure 3 Conceptual Framework
H= Hypothesis

b. Technological aspect

[redacted]

[redacted] t(25).

H1: technological aspect influences patients' satisfaction on telemedicine

H2: technological aspect influences patients' preference of telemedicine

c. Accessibility

[redacted].

H3: Accessibility influences the patients' satisfaction on telemedicine

H4: Accessibility influences patients' preference of telemedicine

d. Perceived Usefulness

[redacted]40).

H5: Perceived usefulness positively influences the patients' satisfaction on telemedicine

H6: Perceived usefulness positively influences the patients' preference of telemedicine

e. Service Quality

[redacted](16, 41, 42).

H7: Service quality influences patients' satisfaction on telemedicine

H8: Service quality influences patients' preference of telemedicine

f. Similarity to Face-to-Face Interaction

[redacted](39).

H9: Similarity to face-to-face interaction influences the patients' satisfaction on telemedicine

H10: Similarity to face-to-face interaction influences the patients' preference of telemedicine

g. Convenience

[redacted](18, 43-45).

H11: Convenience influences the patients' satisfaction on telemedicine

H12: Convenience influences the patients' preference of telemedicine

8. Conclusion

A literature review of previous studies was carried out and gave result, out of 24 initial articles, to six most used independent variables in investigating patients' satisfaction and

preference of telemedicine. And that patients' satisfaction of previous experience of using telemedicine has a moderating effect on their preference.

To test this conceptual paper, an empirical study is intended. [redacted].

And so, the hope is that the intended study can help healthcare service providers get a glance of how patients perceive the telemedicine service, so that they could manage their business, allocate the resources more efficiently and accordingly. Ultimately this is so that people are comfortable in choosing either delivery of healthcare service, directly from the hospital or from the comfort of their own homes, knowing they would receive the same quality of health advice and treatment despite the lower cost and less physical interaction.

References

1. Mohd Arif MF, Choo Ta G. COVID-19 Pandemic Management: A Review of the Digitalisation Leap in Malaysia. Sustainability [Internet]. 2022; 14(11).
2. WHO. Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth 2009. 2010.
3. Bundesärztekammer A-T. Telemedizinische Methoden in der Patientenversorgung – Begriffliche Verortung 2015 [Available from: https://www.bundesaerztekammer.de/fileadmin/user_upload/downloads/pdf-Ordner/Telemedizin_Telematik/Telemedizin/Telemedizinische_Methoden_in_der_Patientenversorgung_Begriffliche_Verortung.pdf.
4. Sood S, Mbarika V Fau - Jugoo S, Jugoo S Fau - Dookhy R, Dookhy R Fau - Doarn CR, Doarn Cr Fau - Prakash N, Prakash N Fau - Merrell RC, et al. What is telemedicine? A collection of 104 peer-reviewed perspectives and theoretical underpinnings. (1530-5627 (Print)).
5. (KBV) KB. TELEMEDIZIN [Available from: https://www.kbv.de/html/telemedizin.php.
6. (MIDA) MIDA. Telemedicine and Digital Health: A New Normal for Healthcare Providers2021. Available from: https://www.mida.gov.my/telemedicine-and-digital-health-a-new-normal-for-healthcare-providers/.
7. Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US. JAMA Internal Medicine. 2021;181(3):388-91.
8. Batumalai K. Telemedicine Services In Private Hospitals Rose During Covid-192022.
9. Mat Som MH, Norali AN, Ali M. Telehealth in Malaysia—An overview2010.
10. Koh D. COVID-19: Malaysia's pandemic approaches and its impact on telehealth2020.
11. Kumar A. Malaysia's telemedicine vision gets fresh boost. ComputerWeeklycom. 2020.
12. Nair P. 6 Major Trends Boosting the Telemedicine Market in Health Care. Pharmacy Times. 2022.
13. Lok Wong Samson WT, Gina Turrini, Steven Sheingold. Medicare Beneficiaries' Use of Telehealth in 2020: Trends by Beneficiary Characteristics and Location. ASPE, Department of Health and Human Services. 2021.
14. (GVR) GVR. South East Asia Telehealth Market Size, Share & Trends Analysis Report By Service Type (Remote Patient Monitoring, Real-time Interactions), By Delivery Mode, By Application, By Type, By End Use, And Segment Forecasts, 2021 - 2028. 2021.
15. Lee E. Tech: The future of telehealth start-ups in the post-pandemic era. The Edge Malaysia. 2022.
16. Abdulwahab SA-OX, Zedan HA-O. Factors Affecting Patient Perceptions and Satisfaction with Telemedicine in Outpatient Clinics. (2374-3735 (Print)).

17. Thirunavukkarasu A, Alotaibi NH, Al-Hazmi AH, Alenzi MJ, Alshaalan ZM, Alruwaili MG, et al. Patients’ Perceptions and Satisfaction with the Outpatient Telemedicine Clinics during COVID-19 Era in Saudi Arabia: A Cross-Sectional Study. Healthcare [Internet]. 2021; 9(12).

18. Predmore ZS, Roth E, Breslau J, Fischer SH, Uscher-Pines L. Assessment of Patient Preferences for Telehealth in Post–COVID-19 Pandemic Health Care. JAMA Network Open. 2021;4(12):e2136405-e.

19. Powell RE, Henstenburg JM, Cooper G, Hollander JE, Rising KL. Patient Perceptions of Telehealth Primary Care Video Visits. The Annals of Family Medicine. 2017;15(3):225.