

Telemental health applications in Saudi Arabia

*An investigation of multidimensional trust, social
stigmatisation, and subjective norms*

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Abstract

Background: Telemental health (TMH) is the use of several technologies combined to remotely deliver/receive mental health care services, including therapy and treatment. Despite the promise of TMH applications to respond to situations like the COVID-19 pandemic, research has reported that there are barriers to its adoption in Saudi Arabia. To date, there is limited theory-based empirical evidence available in Saudi Arabia assessing people's acceptance of and intention to use TMH applications.

Purpose: Drawing on the technology acceptance model, the theory of reasoned action, and the literature on multidimensional trust and perceived social stigma, this study aims to investigate the extent to which people's perceptions of trust, perceived stigma, and subjective norms influence their acceptance of and intentions to use TMH applications to seek professional psychological help.

Method: An online survey was administered. Two hundred twenty-two complete responses were collected and analysed using the partial least squares data analysis method.

Results: The findings showed that the intention to use TMH applications was influenced by trust, perceived ease of use, and perceived usefulness. Further, although perceived social stigma had a direct negative influence on the perceived ease of use of TMH applications, it showed no influence on the intention to use the applications. Subjective norms has no influence on acceptance and intention to use. Moreover, trust in technology had the strongest influence on overall trust in TMH applications.

Conclusion: The outcomes of this study provide valuable information about factors that may hinder or facilitate acceptance of and intention to use TMH applications in Saudi Arabia, which can be used to assist future developments of TMH applications. Research findings also confirm

the applicability of the technology acceptance model with additional variables for identifying acceptance of TMH applications among the adult Saudi population. The study also highlights the necessity of increasing awareness about mental health and the benefits of TMH applications.

Attestation of Authorship

“I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.”

Author's Signature:

Date: 24/05/2022

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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Table of Contents

Abstract.....	ii
Attestation of Authorship	iv
Acknowledgments	v
Table of Contents	vii
List of Figures.....	xi
List of Tables	xii
List of Abbreviations	13
Chapter 1- Introduction	14
1.1 Overview.....	14
1.2 Research Importance and Motivation.....	15
1.3 Research Aims	21
1.4 Research Questions.....	22
1.5 Contributions and Implications for Practice.....	22
1.6 Thesis Outline.....	25
1.7 Summary.....	26
Chapter 2- Literature Review	27
2.1 Overview.....	27
2.2 Mental Health in Saudi Arabia	28
2.3 Telemental Health (TMH)	30
2.4 Trust in Telemental Health Applications.....	32
2.5 Mental Health and Stigma	34
2.6 Subjective Norms.....	36
2.7 Technology Acceptance Model (TAM).....	38
2.7.1.1 Health Technology & Technology Acceptance Model.....	40
2.7.1.2 Mental Health & Technology Acceptance Model	41
2.8 Summary.....	44
Chapter 3- Hypotheses.....	45
3.1 Overview.....	45
3.2 Development of the Research Model	46

3.2.1 Multidimensional Trust	49
3.2.1.1 <i>Trust in the Care Organisation</i>	49
3.2.1.2 <i>Trust in the Care Professional</i>	50
3.2.1.3 <i>Trust in the Treatment</i>	51
3.2.1.4 <i>Trust in the Technology</i>	53
3.2.2 Trust and Perceived Social Stigma	53
3.2.3 Trust and the Technology Acceptance Model	54
3.2.4 Perceived Social Stigma	55
3.2.5 Subjective Norms	57
3.2.6 Subjective Norms and the Technology Acceptance Model	58
3.2.7 Technology Acceptance Model	59
3.3 Summary	61
Chapter 4- Methodology	62
4.1 Overview	62
4.2 Study Design	63
4.3 Participants	64
4.4 Recruitment Procedure	65
4.5 Measures	65
4.5.1 Demographic Survey Questions	66
4.5.2 Trust	67
4.5.2.1 <i>Trust in the Care Organisation</i>	67
4.5.2.2 <i>Trust in the Care Professional</i>	68
4.5.2.3 <i>Trust in the Treatment</i>	68
4.5.2.4 <i>Trust in the Technology</i>	68
4.5.2.5 <i>Trust in Telemental Health Applications</i>	69
4.5.3 Perceptions of Stigmatisation by Others for Seeking Help	69
4.5.4 Subjective Norms	70
4.5.5 Technology Acceptance Model	71
4.5.5.1 <i>Perceived Ease of Use</i>	72
4.5.5.2 <i>Perceived Usefulness</i>	72
4.5.5.3 <i>Intention to Use</i>	72

4.6 Translation Procedure	73
4.7 Data Analysis	74
4.7.1 Introduction to Structural Equation Modelling	74
4.7.2 Partial Least Squares Structural Equation Modelling.....	76
4.7.3 Common Method Bias.....	78
4.7.4 Control Variables.....	78
4.7.5 Measurement Model Analysis	79
4.7.5.1 Internal Consistency Reliability	79
4.7.5.2 Convergent Validity.....	80
4.7.5.3 Discriminant Validity	81
4.7.6 Structural Model Analysis	82
4.7.6.1 Collinearity Assessment.....	82
4.7.6.2 Structural Model Path Coefficients	83
4.7.6.3 Coefficient of determination (R^2).....	83
4.7.6.4 Effect Size (f^2)	84
4.7.6.5 Predictive Relevance (Q^2)	84
4.8 Model Fit	85
4.9 Summary.....	86
Chapter 5- Results.....	87
5.1 Overview.....	87
5.2 Descriptive Statistics	88
5.3 Common Method Bias.....	90
5.4 Control Variables.....	90
5.5 Measurement Model Assessment	92
5.5.1 Indicator Reliability and Internal Consistency Reliability	92
5.5.2 Convergent Validity	97
5.5.3 Discriminant Validity	97
5.6 Structural Model Assessment	103
5.6.1 Collinearity Assessment	103
5.6.2 Structural Model Path Coefficients	105
5.6.3 Coefficient of Determination (R^2 value).....	108

5.6.4 Effect Size(f^2).....	108
5.6.5 Predictive Relevance (Q^2).....	109
5.7 Model Fit	110
Chapter 6- Discussion	112
6.1 Overview.....	112
6.2 Summary of Main Findings	113
6.3 Discussion of the Survey Findings	113
6.4 Implications	122
6.4.1 Implications for Theory	122
6.4.2 Implications for Practice.....	123
6.5 Summary.....	124
Chapter 7- Conclusion	125
7.1 Overview.....	125
7.2 Research Summary	126
7.3 Future Research Directions.....	130
7.4 Limitations.....	131
7.5 Concluding Remarks	132
References	134
Appendix A: Ethics Approvals	172
Appendix B: Study poster	177
Appendix C: Questionnaire.....	178

List of Figures

Figure 1 Technology Acceptance Model (TAM).....	39
Figure 2 Research Model and Hypotheses.....	48
Figure 3 Diagram of Reflective and Formative Constructs	77
Figure 4 Outer Loadings	93
Figure 5 Outer Loadings, Continued.....	94
Figure 6 Structural Research Model, Including Standardised Path Coefficients and R Squared Values.....	105

List of Tables

Table 1 Research Constructs and Their Definitions	47
Table 2 Rules of Thumb for Selecting CB-SEM or PLS-SEM	75
Table 3 Demographic Analysis Results (n= 222)	89
Table 4 Common Method Bias Variance Inflation Factor Rresults.....	90
Table 5 Results for User Type Control Variable for the Structural Model.....	91
Table 6 Outer Loadings, Construct Reliability, and Validity	96
Table 7 Cross-Loading Values.....	99
Table 8 Fornell-Larcker Criterion.....	102
Table 9 Heterotrait-monotrait ratio Values	103
Table 10 Outer VIF Values	104
Table 11 Structural Model Path Coefficient Values	106
Table 12 Summary of Measurement Model Assessment (R^2 and Q^2 Values).....	108
Table 13 Structural Model Effect Size (f^2) Values	109
Table 14 Summary of Hypothesis Testing Results.....	110
Table 15 Standard Root Mean Residual Values	111

List of Abbreviations

AVE	Average variance extracted
CB-SEM	Covariance-based structural equation modelling
CR	Composite reliability
f^2	Effect size
GoF	Goodness-of-fit index
HTMT	Heterotrait-monotrait ratio
IU	Intention to use
PATAT	Patient trust assessment tool
PEU	Perceived ease of use
PLS-SEM	Partial least squares structural equation modelling
PSOSH	Perceptions of Stigmatization by Others for Seeking Help
PU	Perceived usefulness
Q^2	Predictive relevance
R^2	Coefficient of determination
SA	Saudi Arabia
SEM	Structural equation modelling
SN	Subjective norms
SRMR	Standardised root mean square residual
TAM	Technology acceptance model
TAM2	Extension of the original Technology acceptance model
TCO	Trust in the care organisation
TCP	Trust in the health care professional
TMH	Telemental health
TRA	Theory of reasoned action
TT	Trust in the treatment
TTech	Trust in the technology
TTMHA	Trust in telemental health applications
UTAUT	Unified theory of acceptance and use of technology

Chapter 1- Introduction

1.1 Overview

This chapter provides a background of the study and outlines its foundations. The chapter begins by describing the importance of the research and motivation for the study, which focuses on the acceptance and adoption of telemental health applications in Saudi Arabia. It presents an overview of telemedicine and telemental health and discusses benefits and barriers to their adoption. This is followed by a discussion of the acceptance and use of telemental health applications in Saudi Arabia. In the next section, the chapter describes the theoretical foundations of the study, emphasising the technology acceptance model and how it has been integrated into health informatics research. The role of multidimensional trust, perceived social stigma, and subjective norms in mental health generally and telemental health applications specifically are also addressed. The following section of this chapter presents the purpose of the thesis and the research questions it intends to answer. In the next section, the theoretical and practical contributions of the study are discussed. Lastly, the content of each chapter is briefly described, and the chapter is summarised.

1.2 Research Importance and Motivation

Integrating information technology and telecommunications with medicine has revolutionised the delivery of health care services. Telemedicine is able to provide medical services across distances without the traditional face-to-face interaction between patients and physicians. It has proven to be a valuable tool in increasing the ability of health care systems to deliver care to patients. Communication through telemedicine may be synchronous, meaning the interaction occurs in real time through, for example, videoconferencing or audio calls, or asynchronous, which entails storing and forwarding information such as images via email or text (Wilson & Maeder, 2015). There is a growing body of research on telemedicine in Saudi Arabia (SA) highlighting positive findings and increased use of telemedicine among a variety of patient groups, in rhinology (Alshareef et al., 2021), diabetes types 1 and 2 (Alharthi et al., 2021; Tourkmani et al., 2021), musculoskeletal care (Alhamam et al., 2021), and primary health care (Alharbi et al., 2021).

One subcategory of telemedicine is telemental health (TMH), also known as telepsychology, telepsychiatry, or telerehabilitation. It uses the internet to deliver mental health care services via phone, mobile applications, video conferencing, email, text, avatar therapy, gamification, or web-based interventions (Irvine et al., 2020; Langarizadeh et al., 2017; Pompeo-Fargnoli et al., 2020). Benefits of TMH for patients include easier access to care, reduced costs, flexibility, reduced stigma, and interactive sessions between patients and their physicians, in addition to offering effective interventions to patients with various mental illnesses (Aboujaoude et al., 2015; Irvine et al., 2020; Langarizadeh et al., 2017; Madigan et al., 2021).

A TMH application is a mobile application that is used by patients to receive mental health care services provided by mental health care professionals via smart devices, such as a smartphone (Pompeo-Fargnoli et al., 2020). TMH mobile applications have been shown to play a significant role in the screening for mental illness, self-management, monitoring, and health

education (BinDhim et al., 2015). The applications offer users convenience, personalisation, and reminders and are portable, mobile, and ubiquitous (Aboujaoude et al., 2015; Luxton et al., 2011; Pompeo-Fargnoli et al., 2020). Telemental health applications have proven to be successful when the target users accept them (BinDhim et al., 2016), and reports have shown that some favour the use of TMH applications over face-to-face consultations (Gun et al., 2011).

However, it is important to note that cultural norms, beliefs, and customs play a big role in people's adoption of technology (Al-Gahtani et al., 2007; Nwabueze et al., 2009; Qureshi et al., 2021) as well as in their acceptance and rejection of mental illness (American Psychiatric Association, 2013; Koenig et al., 2014). In SA, people's belief in supernatural forces, such as *Jinn* (a spirit of lower rank than angels), black magic, and the evil eye (which they do not condone, but believe exist), has caused doubts and confusion about the legitimacy of mental illness (Al-Habeeb, 2003; Jelaidan et al., 2018). People believe that such forces adversely affect one's health and behaviour. Consequently, they often seek the help of a faith healer instead of a mental health professional, or seek professional help secretly or simply avoid it. Furthermore, stigma associated with mental illness is widespread in SA (Alattar et al., 2021; Alsubaie et al., 2020; Jelaidan et al., 2018; Koenig et al., 2014). It often extends to a person's family members (AlAteeq et al., 2020; Alattar et al., 2021) and has been shown to negatively influence help-seeking behaviours (Alsubaie et al., 2020; Clement et al., 2015). This suggests that people prefer to have an undiagnosed than a diagnosed mental illness to avoid social shame and stigmatisation.

Today, mental health is of even more concern due to the COVID-19 pandemic. Similar to most countries, SA implemented public health measures, including lockdowns, mandatory quarantine, delay of non-essential services, physical distancing, working from home, travel restrictions, and suspension of religious activities such as *Umrah* (lesser pilgrimage) mass

gatherings in Makkah and prayer in mosques (BinDhim et al., 2021; Yezli & Khan, 2020), aimed at minimising the spread of COVID-19. Such measures appear to have adverse effects on the psychological wellbeing of the Saudi population (Yezli & Khan, 2020), as they prevent people from accessing necessary health care, reduce support services, and increase fear of illness and infection, anxiety, depression, and loneliness (AlAteeq et al., 2020; Alenazi et al., 2020; Alheneidi et al., 2021; Alyami et al., 2021; BinDhim et al., 2021). This is also observed around the world (Asmundson et al., 2020; Gruber et al., 2021; Madigan et al., 2021; Qiu et al., 2020; Racine et al., 2020).

While TMH has the potential to respond to social and cultural challenges and to disasters and emergencies, such as the COVID-19 pandemic, the adoption and use of TMH applications has not been widely researched in SA due to its novelty. It is not surprising, therefore, that the available literature focuses primarily on the establishment of guidelines, protocols, and frameworks for TMH in the country (Alqahtani et al., 2021; Qureshi et al., 2021). Although there are studies focusing on telemedicine applications, that is, applications that provide mental as well as general health care services, such studies do not address mental health, nor do they attempt to explain research findings in light of mental health.

Research from SA found that users of the telemedicine application *Seha*, used for providing health care services including mental health care, report increased satisfaction, find the application to be efficient, and believe that it improves access to health care services as compared with non-users (Alharbi et al., 2021). Other studies indicated that people have positive opinions of telemedicine's potential and capability, as evidenced by 84% of physicians (Amin et al., 2020) and 80% of responses to an open-ended survey of Saudis (Alshammari & Hassan, 2019) who expressed an interest in using telemedicine. In contrast, a study conducted by Atallah et al. (2018) concluded that although mental health patients are willing and capable of controlling their mental health using telemedicine applications, only 16% of respondents

have actually used telemedicine applications to manage their mental health. This indicates that although people acknowledge the benefits of TMH applications, there are factors influencing their low or non-use of those applications. Therefore, the immediate objective of this study is to identify some of the factors that could influence people's help-seeking intentions and behaviours leading to the acceptance and use of TMH applications.

In reviewing existing research on TMH and telemedicine applications in SA, it was found that much of it was descriptive and lacked theoretical basis, such as those undertaken by Alshammari and Hassan (2019), and Alharbi et al (2021). The use of a theoretical framework provides structure and support for the study by insuring it is informed by theory. Over the last few decades, research has centred on developing and testing theories and models to better understand the antecedents of technology adoption, intention to use, and usage behaviour. Among such models is the technology acceptance model (TAM) (Davis, 1989) which is based on the social psychology theories: the theory of planned behaviour (Ajzen, 1985; Ajzen & Madden, 1986), an extension of the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975). Essentially, the three models focus on a person's intention to perform a specific behaviour.

In various health care settings within SA, researchers who employed the TAM have reported findings consistent with those from previous research. The list includes clinical decision support health systems (Aljarboa et al., 2019), radiology (Aldosari, 2012), electronic medical records (Aldosari et al., 2018; Bamufleh, 2021), wearable health devices (Hokroh et al., 2020), and mobile health applications (Bamufleh et al., 2021). However, to date in SA, researchers have not undertaken studies on the applicability of the TAM or its extensions to mobile health applications in the context of mental health (i.e., TMH) but rather focus on applying it to general health care, such as e-government health applications (Bamufleh et al., 2021) and e-health (AlBar & Hoque, 2019).

Although the TAM is the dominant framework in the field of health informatics, it reportedly does not offer an optimal model (Rahimi et al., 2018). Hence, researchers often extend the original model by introducing other factors such as subjective norms (AlBar & Hoque, 2019), social influence (Kim et al., 2016), and multidimensional trust (Abbas et al., 2018; Bamufleh et al., 2021; Baudier et al., 2020; Deng et al., 2018).

The concept of trust is multidimensional, particularly in the context of health care integrated with technology. Studies of trust in health technology support the integration of trust as a determining factor for technology acceptance and use (Montague et al., 2010; van Velsen et al., 2017, 2021; Yang et al., 2021). In their article, Velsen et al. (2017) define trust in telemedicine services as the patient's willingness to depend on the services, in this case TMH applications, and the factors that it entails in exchange for personal gain. Reports have shown that lack of trust in mental health applications is a barrier to their adoption (Alqahtani & Orji, 2020), resulting in low levels of user engagement (Torous et al., 2018).

The present study builds on findings from the broader literature on trust in health technology to assess the influence of multidimensional trust on people's acceptance of and intention to use TMH applications. People's level of trust in technology within health care appears to be critical not only to its acceptance and adoption but also for treatment outcomes. For people to form trust in TMH applications, an evaluation is made that considers trust in the care organisation (TCO), trust in the health care professional (TCP), trust in the treatment (TT), and trust in the technology (TTech).

Subjective Norms (SN) is derived from the TRA and refers to one's perception that people who are important to the individual approve or disapprove of a particular behaviour, in this case using TMH applications. The significance of subjective norms and how they may considerably alter individuals' intentions and behaviour towards adopting technology has been

highlighted in the literature (Aljarboa et al., 2019; Bamufleh et al., 2021; Venkatesh & Davis, 2000). In a collectivistic (Alhirz & Sajeev, 2015; Hofstede, 1983), non-Western society such as the SA society, others' opinions are anticipated to have strong impact on an individual's decision to adopt TMH applications, especially if that individual is in a state of uncertainty and vulnerability as a result of having mental illness. Research studies from SA reveal consistent findings on the influence of subjective norms on the adoption of e-health applications and use of mental health services (Bamufleh et al., 2021; Verhaeghe & Bracke, 2011). However, subjective norms have not yet been explored in relation to the acceptance and adoption of TMH applications. Another purpose of this study is, therefore, to fill this gap.

The ability to use TMH applications without attracting public attention, as is the case with in-person clinic visits, means that people seeking psychological help may not necessarily be exposed to public stigma. Yet, although an individual may not personally encounter stigma, Verhaeghe and Bracke (2011) explained that an individual may distrust mental health services due to his or her perceptions of being stigmatised. This suggests that stigma could have an influence on the acceptance and use of TMH applications regardless of the method used to seek psychological help. This study is, therefore, concerned with individuals' perceptions of being stigmatised by those closest to them (i.e., family and friends) and how this influences their intentions towards using TMH applications. There is a need for further research assessing this form of stigma, as it has not yet been investigated in the SA literature in relation to mental health services or TMH applications.

The purpose of this study is, in summary, to identify the influence of multidimensional trust, perceived social stigma, and subjective norms on people's acceptance of and intention to use TMH applications in SA, a topic that has received little attention in the literature in relation to SA.

1.3 Research Aims

The aims of this study are to:

- 1- propose a research model that investigates people's acceptance of TMH applications by building on existing theories (TAM and TRA) and incorporating multidimensional trust and the mental health-related component of perceived social stigma;
- 2- investigate the influence of multidimensional trust (trust in the care organisation, trust in the health care professional, trust in the treatment, and trust in the technology) on people's acceptance of and intentions towards adopting TMH applications in SA, and also to shed light on which dimension of trust is of more influence on the overall trust in TMH applications;
- 3- examine the influence of subjective norms in SA on people's acceptance of and intentions towards using TMH applications;
- 4- examine people's perceived social stigma from those closest to them and give a better understanding of how it influences their intentions towards seeking professional mental health care through TMH applications; and to
- 5- assess the influence of mental health-related stigma on people's perceived usefulness and ease of use of TMH applications in SA, with consideration for the contribution of mental illness to people's perceptions.

1.4 Research Questions

In light of the study's aims, the following questions were investigated:

- 1- Does trust in TMH applications influence an individual's acceptance of and intentions towards using TMH applications?
- 2- Does the perception of social stigma influence individuals' acceptance of and intentions to use TMH applications?
- 3- Do subjective norms influence individuals' acceptance of and intentions to use TMH applications?
- 4- Do perceived ease of use and perceived usefulness influence individuals' intentions to use TMH applications?

1.5 Contributions and Implications for Practice

Several aspects of the study contribute to current research and practice. First, based on available literature and well-established theories and scales, the study provides a theoretically grounded conceptual framework to give a more comprehensive understanding of factors that influence individuals' acceptance of and intentions towards using TMH applications.

Second, the study gives a better understanding of TMH acceptance by combining technological and social factors in relation to mental health and identifying how they interact to influence people's acceptance of and intentions towards using this form of technology to seek professional mental health care in SA.

Third, by incorporating multidimensional trust into the research framework, the study provides contributions to trust literature and practice.

The study contributes to the progress of theories of trust development with a focus on how the multiple dimensions of trust function collectively to influence acceptance and use intentions. The focus on TMH applications provides an appropriate context for the study to investigate the multidimensions of trust, since trust exists on organisational, interpersonal, treatment, and technological levels.

Furthermore, the study sheds light on various areas which have been reported as barriers to the use of telemedicine. These include laws and legislations (trust in the care organisation), care professionals' competency (trust in the care professional), treatment effectiveness (trust in the treatment), and privacy and security (trust in the technology). This may be of benefit to health care organisations and service providers, as they are given a better understanding. Thus, they can shift their attention to building trust with target users and convey the message that the health and needs of the target users are of primary importance.

Fourth, the study will also contribute to the literature that is focused on identifying if stigma hinders technology acceptance and adoption, in this case pertaining to TMH applications. Based on the study findings, it will be possible to determine whether the perceived social stigma is a barrier to seeking psychological help via technological means that can be used privately and with secrecy.

This is informative to the research community, service developers and providers, and mental health care professionals in addition to mental health patients to be mindful of their perceptions of stigma and how it may effect help-seeking behaviours. TMH applications' developers who are mostly engaged in developing, testing, and implementing the applications will gain a better understanding of the social factors that may influence the adoption of the applications and why TMH applications are not as widely used as may have been originally anticipated, given their benefits.

Fifth, the study provides a better understanding of people's perceived stigmatisation from those within their close social networks for using TMH applications to seek psychological help. This knowledge can benefit families and social networks of individuals who suffer from mental illness in the Saudi society, which may in turn benefit the patients. This is because the study stresses the importance of support and engagement from family and friends for patients when it comes to seeking mental health treatment through the use of TMH applications. Essentially, although public stigmatisation of individuals with mental illness is common in SA, when individuals perceive their family and close social networks as less or not stigmatising, they are more likely to accept and adopt TMH applications to seek professional help rather than avoid or delay help seeking, and vice versa. Consequently, the study findings will shed light on this form of stigmatisation and the importance of focusing on reducing its prevalence.

Sixth, this study contributes to the literature by focusing on the SA context and employing subjective norms as a construct within the proposed research model. This will give a better understanding of the extent to which Saudis value the perceptions and opinions of others when it comes to acceptance of and intentions to use TMH applications.

Lastly, the study will demonstrate the applicability of the TAM in mental health care in a different demographic, SA, with an emphasis on TMH applications that have yet to be explored in the literature. In addition, it incorporates multidimensional trust, perceived social stigma, and subjective norms to extend and enhance the value of the TAM from mental health perspectives. Although TMH applications are in the infancy stage in SA (Banjar & Alfaleh, 2021), people have high and positive perceptions of TMH services. It is therefore imperative that service providers, both government agencies and private organisations, gain a better understanding of the elements that contribute in low and slow adoption of TMH applications among target users. Additionally, they can use the findings to better understand the Saudi

perspective and develop effective instructional approaches to better educate the public on the usefulness, ease of use, trustworthiness, availability, and accessibility of TMH applications.

1.6 Thesis Outline

Seven chapters make up this thesis. The Introduction gives an overview of the importance and motivations for the research, with a focus on the Saudi context. The purpose of the study is then briefly outlined, followed by the research questions and the study's contributions. The Literature Review (Chapter 2) evaluates the available literature on telemedicine and TMH, multidimensional trust, perceived stigma, subjective norms, and the underpinning theories employed in this research. The gaps are identified based on the literature review. Chapter 3, The Research Model and Hypotheses, presents the proposed research model, construct definitions, and study hypotheses based on the literature review. The hypotheses are listed with a discussion of supporting evidence.

The methods employed in this study are presented in Chapter 4. It begins with the study design, followed by the research participants and recruitment procedure. Later, a discussion of the instruments and scales used to undertake the study is drawn. Survey translation procedure and ethics are also presented in this chapter. The data analysis method is then discussed in detail. Chapter 5, Data Analysis, presents the results using partial least squares structural equation modelling (PLS-SEM). Descriptive statistics of the participants is presented, then the measurement model assessment, followed by the structural model assessment. The Discussion, Chapter 6, provides an overall discussion of the study findings. The research questions and hypotheses are answered, and the study's implications are discussed. Lastly, the Conclusion summarises the study and highlights the study's limitations, and future research guidelines.

1.7 Summary

This chapter set the groundwork of the research. It began by outlining the current situation and, from that, the significance and motivation for the study. The purpose of the study and research questions were introduced, along with a discussion of the study's potential contributions to the literature and implications for actual practice. Finally, the thesis outline was presented. The succeeding chapter reviews the available literature to give a better understanding of how people's intentions to use TMH applications are influenced by factors such as trust, perceived social stigma, and subjective norms.

Chapter 2- Literature Review

2.1 Overview

In this chapter, the focus is on identifying and critically analysing the literature and school of thought. It starts by introducing mental health and refers to international literature while referencing SA culture and context where applicable. The next section addresses TMH applications and efficacy. Then, the existing literature is used to develop an understanding of the influence of multidimensional trust, perceived social stigma, subjective norms, and perceived usefulness and ease of use on people's intentions to use TMH applications in SA. This includes discussing key theories significant to technology adoption and the basis for their use in the study. Identified gaps are used to establish the need for further research, and the focus and boundaries of the research are presented.

2.2 Mental Health in Saudi Arabia

Mental health can be defined as “a state of well-being in which an individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community” (World Health Organization, 2018, para.1). Mental illness is complex and includes a wide variety of disorders including bipolar, depression, anxiety, trauma, and eating disorders, to name a few (American Psychiatric Association, 2013). It can have serious effects; depression, for example, is a common mental illness (Liu et al., 2020) and the leading cause of disability worldwide (Friedrich, 2017). Symptoms can be initiated by many factors including stressful life events, isolation, and poverty (Link et al., 2018). Mental illness results in a dysfunction (American Psychiatric Association, 2013) consequently affecting one’s quality of life (Liu et al., 2020), increasing the risks of developing cardiovascular disease (Seligman & Nemeroff, 2015), and increasing mortality (Link et al., 2018).

In SA, mental health disorders are reported to be 13.7% prevalent (Dattani et al., 2021). However, it is possible that the prevalence is higher, because mental illness tends to go largely unreported compared with other conditions (Bharadwaj et al., 2017). Findings from research by BinDihm et al. (2021) indicate that the percentage of people at risk of developing major depression and generalised anxiety disorders in SA is 14.9% and 11.4%, respectively. In another study 55.8% of participants reported that the COVID-19 pandemic restrictions had a negative impact on their mental health and that they experienced difficulty accessing health care (Shatla et al., 2020). Difficulties and disruptions in health care delivery may worsen mental health conditions and expedite symptoms. Therefore, to mitigate this, the Ministry of Health in SA is moving towards a more digitised health care system by deploying the most effective technologies, including telemedicine and mobile health applications (Alhodaib & Alanzi, 2021; Banjar & Alfaleh, 2021), to ensure that mental health services are widely accessible and

available to the population (Al Mousa et al., 2021). Additionally, the country is witnessing increased efforts directed towards improving the quality of mental health services, including the establishment of policies (Al Mousa et al., 2021).

However, sociocultural and Islamic beliefs have an impact on the way people perceive and cope with mental illness in SA (Al Mousa et al., 2021). Collectivist cultures value extended family relationships, interdependence, humility, and selflessness and have a strong sense of community and belonging. In contrast, individualistic cultures place more emphasis on the immediate family, autonomy, independency, and self-sufficiency (Hofstede, 1983). As the basis of the Saudi Arabian culture, the religion of Islam focuses on interconnected communities and stresses the rights of one's neighbours, family, and wider community. Families, friends, neighbours, tribes, and social groups play an important role in the lives of individuals, and, also, social gatherings are very common in the country (BinDhim et al., 2021). Therefore, SA has been categorised as a collectivist culture (Alhirz & Sajeev, 2015). A person with mental illness experiences a shift in consciousness that may distance all meaning and happiness from their conscious life, and when mental illness is supplemented with a display of behaviours that are deemed abnormal within society, the individual will often endure social shame and stigma. In SA, the shame is extended onto the individual's family, possibly due to the collectivist cultural dynamic, causing the individual to avoid seeking treatment.

Further, the belief in supernatural forces can cause confusion when it comes to identifying and diagnosing mental illnesses. For instance, a jinn's possession of a human can result in abnormal behaviours that may be interpreted as psychotic disorders. Individuals who are battling such forces will often show symptoms that are also present in people who suffer from mental illness, for example, fatigue, hallucinations (Ally & Laher, 2008), and epilepsy (Koenig et al., 2014). Moreover, this confusion may be further exacerbated by the lack of knowledge about mental illness and its causes (Abolfotouh et al., 2019; Alangari et al., 2020). Therefore,

the belief in supernatural forces coupled with limited knowledge can hinder people's ability to distinguish mental illness and can cause them to delay seeking mental health treatment.

It should be noted that in cultures and communities based on Islam, seeking help from a faith healer is more acceptable and at times preferred over a mental health professional (Ali & Gul, 2018). For example, a study found that most Saudi adults (54.5%) have negative attitudes towards seeking professional mental health care, which may indicate their preference to seek help through other avenues such as religious and spiritual therapy (Abolfotouh et al., 2019). This is because faith healers recite verses from the Quran, which is believed to have healing powers. This form of treatment is one of the most commonly used forms of therapy within the Muslim world (Tanhan & Young, 2022), and it has been reported in the literature to be effective among patients (Rafique et al., 2019; Saged et al., 2020). People's preference to have their health concerns addressed from a religious perspective, by reciting the Quran or seeking help from a faith healer, may be the result of the perception held by some people in SA, that having a mental illness is a consequence of weak faith (i.e., being less of a Muslim) (Alattar et al., 2021), despite the fact that the religion views health problems as a blessing since it is a means of cleansing and purifying one's sins (Rassool, 2000).

2.3 Telemental Health (TMH)

Several studies have been undertaken in the past decade to determine whether TMH can provide mental health services effectively to patients with varying conditions and levels of illness severity. A systematic review focusing on the effectiveness of videoconferencing psychotherapy in the treatment of depression found that 21 of the 33 reviewed papers found significant decrease in depression symptoms (Berryhill et al., 2019). A more recent study by Zimmerman et al. (2021) found that the use of telehealth is as effective as in-person treatment

in patients with borderline personality disorder in partial hospital settings. Patients were satisfied and reported improvement in their mental health and general well-being (Zimmerman et al., 2021). Evidence from the literature suggests that TMH is comparable to the traditional, in-person, mental health care when it comes to improving individuals' mental health and development of strong patient-therapist relationships, and that it demonstrates similar levels of success in improving clinical outcomes (Hilty et al., 2013; Kocsis & Yellowlees, 2018; Pruitt et al., 2014; Wilson & Maeder, 2015).

Research into the effectiveness of TMH applications within the Saudi population is limited. However, researchers who are starting to shed light on TMH stress the importance of the technology and its potential to benefit the SA population. Guidelines and protocols for the implementation of telepsychology during COVID-19 and telerehabilitation based on standards of the American Telemedicine Association and the telemedicine policy in SA have recently been published (Alqahtani et al., 2021; Qureshi et al., 2021). Despite this, difficulties hinder attracting active participation and continuous use of many mental health applications, which has been identified as a major roadblock to their adoption and, ultimately, effectiveness (Alqahtani & Orji, 2020; Torous et al., 2018). Therefore, there is a need to fill this gap by investigating factors that influence people's acceptance of and intentions to use TMH applications in SA. The present study suggests that multidimensional trust, perceived social stigma, subjective norms, and perceived usefulness and ease of use are causal factors that contribute to the acceptance of and intention to use TMH applications, thereby influencing hesitation and resistance to use such applications.

2.4 Trust in Telemental Health Applications

The importance of trust as an indicator of human behaviour is widely acknowledged across many fields, including but not limited to information systems, social psychology, sociology, and economics (Mayer et al., 1995; Ortega Egea & Román González, 2010). Trust facilitates social interactions, and it is a requirement for effective interpersonal relations (Mayer et al., 1995). In SA, the Saudi Ministry of Health continues to dominate the health care sector (Alangari et al., 2020) in spite of the growing role of the private sector. According to studies conducted in SA, the population exhibited high levels of trust in health authorities and cited doctors as the most used and trusted source of health information (Alabbad et al., 2018; Alduraywish et al., 2020; Almutairi et al., 2020). Trust is a necessity for interpersonal relationships, and this is also true for person-to-organisation, person-to-technology, and person-to-system trust (Gogan et al., 2009; Kamal et al., 2020; van Velsen et al., 2015; Yang et al., 2021). Studies have supported the addition of trust as a factor in explaining acceptance and adoption of e-health applications and health information systems (Boon-itt, 2019; Montague et al., 2009; Ortega Egea & Román González, 2010; Tung et al., 2008; van Velsen et al., 2017; Yang et al., 2021).

In the eyes of a patient, trust is an equally important element for technology adoption (van Velsen et al., 2021) as it is for mental health care (Cromer et al., 2017; Klest et al., 2019). There is a considerable body of research on the influence of trust on user acceptance and use of digital health care (Montague et al., 2009; Yang et al., 2021). Several studies have demonstrated that people who trust digital health care are more likely to perceive it as useful and easy to use. They also tend to be more satisfied and are likely to use it (Bamufleh et al., 2021; Deng et al., 2018; Peixoto et al., 2022; Yang et al., 2021).

Although this study has not come across existing research investigating the influence of trust on the intentions to use TMH applications in SA, several studies have discussed the importance of trust in explaining the acceptance of digital health systems, including telemedicine. A study investigating how students perceive telemedicine cabins in SA found that competence, a key component of trusting belief, directly and positively influenced their intentions to use telemedicine cabins (Baudier et al., 2020). This implies that students value competence in care professionals, a concept some researchers refer to as trust in health care professionals (van Velsen et al., 2015, 2017).

Furthermore, findings from a recent study investigating how end-users and health care providers view the security of mobile health applications showed that respondents had concerns about the security and confidentiality of their health information (Aljedaani et al., 2021), an indication of lack of trust in the technology. The authors believe that this is the result of a lack of familiarity and knowledge of security features offered by the applications. In fact, several studies have suggested that trust in the technology, a key component of trust, has significant influence on the use of mental health mobile applications (Alqahtani & Orji, 2020; Torous et al., 2018) and online medical consultation services (Yang et al., 2021) from the perspective of patients. Another study assessing public attitudes towards e-government health applications in SA reported that trust has a significant indirect influence on people's intention to use mobile health applications (Bamufleh et al., 2021). According to another study, lack of trust in telemedicine appears to be the major reason for Saudis' scepticism towards its acceptance and adoption (Alshammari & Hassan, 2019), insinuating that the Saudi public do not trust telemedicine applications to be useful in providing effective health care treatments. As such, trust in technology was extended to encompass the use of TMH applications.

2.5 Mental Health and Stigma

Mental illness is often associated with stigma, a sad reality. As well as in SA (Alattar et al., 2021; Amri & Bemak, 2013; Jelaidan et al., 2018), this phenomenon has been reported by researchers in Australia (Reavley & Jorm, 2011), China (Xu et al., 2018), England (Henderson et al., 2013), New Zealand (Thornicroft et al., 2014), and the United States of America (Parcesepe & Cabassa, 2013). Stigma can be defined as a process involving labelling, stereotyping, separation, status loss, and discrimination; and for stigmatisation to occur, further social and environmental power must be exerted (Link et al., 2018; Link & Phelan, 2001). Research on stigma is interdisciplinary as shown in psychology, sociology, anthropology, political (Link & Phelan, 2001), and technology acceptance studies (Lamela et al., 2020).

According to researchers, stigma associated with mental illness significantly contributes to physical health disparities between people with mental illness and those without (Link et al., 2018). It predicts treatment discontinuation (Sirey, Bruce, Alexopoulos, Perlick, Raue, et al., 2001) and poor treatment adherence (Sirey, Bruce, Alexopoulos, Perlick, Friedman, et al., 2001), decreases trust in mental health services (Verhaeghe & Bracke, 2011), and has negative influence on help-seeking behaviours and intentions (Al-Qadhi et al., 2014; Bharadwaj et al., 2017; Clement et al., 2015; Schnyder et al., 2017). The literature discusses different types of stigma, such as perceived public stigma, which can be further categorised as social stigma, experienced stigma, personal stigma, and self-stigma (Clement et al., 2015; Schnyder et al., 2017).

There is a good body of evidence in the literature examining individuals' perceptions of social stigma and the public's perceptions of those seeking psychological help in SA (AlAteeq et al., 2018; Alattar et al., 2021; Jelaidan et al., 2018). The researchers concluded that stigma related to mental health is evident and negatively influences people's decisions to seek help. Jelaidan et al. (2018) go on to say that many people with mental illness do not seek professional

help, because of the stigma attached to it. To mitigate the negative impact of stigma on help-seeking behaviours, some researchers propose the use of TMH applications and services (Aboujaoude et al., 2015). A possible explanation for this is that TMH applications can be used anonymously and secretly from home without having to visit a mental health clinic in public. Lamela et al. (2020), who looked at the impact of self-stigma on technology acceptance (internet-based psychological interventions), discovered that stigma has a negative influence on technology acceptance, indicating that the effect of stigma is not bound to the traditional methods of seeking psychological help. Other studies focusing on college students (Hadler et al., 2021) and women veterans (Moreau et al., 2018) reported that TMH helps overcome stigma. The Saudi population was not addressed in research focused on the influence of stigma on acceptability of and intentions to use TMH applications at the time of this investigation.

Continuing, to reduce the influence of stigma on help-seeking behaviours, other researchers proposed family engagement (Corrigan et al., 2014). Family support has been a part of Arabic tradition for centuries, and this tradition was reinforced by the religion of Islam (Fakhr El-Islam, 2008). Within the Saudi culture, families are highly interdependent on each other, and family members act as one cohesive unit (Algahtani et al., 2017; Maisel, 2014). Although no empirical studies of family involvement in the use of TMH applications have been carried out in SA, family involvement may serve as a supportive or dissuasive force in enticing a family member to seek professional help.

As Vogel et al. (2009) explained, on the one hand, regardless of stigma and social shame, if an individual's family is highly supportive and encouraging, this may increase the likelihood that he or she will seek help and, in turn, use TMH applications; even though this may not reduce the individual's perception of being stigmatised. If, on the other hand, the individual's family is looking to avoid being stigmatised or shows stigmatising behaviours towards the individual, then it is less likely that he or she will seek professional help. Compared with other

types of stigma, this type is the most relevant to this study, given the accessibility, confidentiality, mobility, security, and privacy offered by TMH applications (Pompeo-Fargnoli et al., 2020).

Consequently, it is necessary to investigate individuals' perceptions of being stigmatised when seeking psychological help, with emphasis on the individuals' immediate social networks and those closest to them, such as family and friends, in the context of the influence of those perceptions on acceptance of and intentions to seek help through TMH applications.

2.6 Subjective Norms

In the health care sector, new technologies are constantly being introduced and implemented in order to provide better patient care. However, successful implementation of new technologies depends on their adoption by the intended users. Focusing on a technology's functionalities alone is not sufficient to convince intended users of its benefits. In view of this, some questions remain unanswered regarding other non-technical factors contributing to the acceptance of and intention to use TMH applications. This study draws from the existing TRA (Fishbein & Ajzen, 1975) to identify factors that may influence the acceptance of and intention to use TMH applications in SA; specifically, the influence of subjective norms.

Theory of reasoned action posits that an individual's actual behaviour is directly influenced by his or her intention, which, in turn, is influenced by his or her perceived behavioural control, attitude, and subjective norms. In other words, one's belief about themselves and the surrounding environment influences their behaviour (Fishbein & Ajzen, 1975). This theory is seen as a well-fitting model for studying human behavioural intentions. Despite its roots in social psychology, the theory has been applied to various research fields including information technology (Moore & Benbasat, 1996) and health informatics (Medlock & Wyatt, 2019).

As originated in the TRA, subjective norms, sometimes referred to as social influence (Venkatesh et al., 2003), is defined as one's perception that most people who are important to him or her would encourage him or her to engage in the behaviour in question (Fishbein & Ajzen, 1975). Fishbein and Ajzen argue that subjective norms predict the behaviour of individuals because people are influenced by the perceptions and opinions of those most important to them, such as family, friends, peers, colleagues, and physicians even when the individual does not agree with the behaviour or believe in it. The direct effect of subjective norms on the intention to adopt technology is inconsistent in the literature. While some researchers report no significant effect of subjective norms on users' intentions to adopt technology (Chau & Hu, 2002; Lau et al., 2001), others highlight their influence and how they can considerably alter user intentions and behaviour towards adopting technology (Arkorful et al., 2020; Kamal et al., 2020; Rahimi et al., 2018; Taylor & Todd, 1995).

Furthermore, an extension of the TAM (TAM2) (Venkatesh & Davis, 2000) includes and supports the influence of subjective norms on user acceptance and adoption of technology. Research findings from SA are consistent with those in the literature, indicating that subjective norms affect patients' intentions when it comes to the use of e-health services (AlBar & Hoque, 2019). Moreover, another study conducted by Bamufleh et al. (2021), examining the public's attitudes towards e-government health applications during the COVID-19 pandemic, suggests that social influence has a positive effect on the intention to use the applications.

Schepers and Wetzels (2007) published a meta-analysis examining the importance of subjective norms as a predictor of technology acceptance and its influence on intentions to use technology. Their study highlighted the significance of subjective norms with an emphasis on the moderating effects of type of respondents, technology, and culture (Schepers & Wetzels, 2007). Taking this into consideration, since the present study focuses on acceptance of and intentions to use TMH applications in a collectivist culture, it is expected that others' opinions

would highly influence individuals' intentions towards using the applications. Therefore, this study incorporates subjective norms in an effort to better understand their influence on people's acceptance and adoption of TMH applications and their behavioural intention towards future use.

2.7 Technology Acceptance Model (TAM)

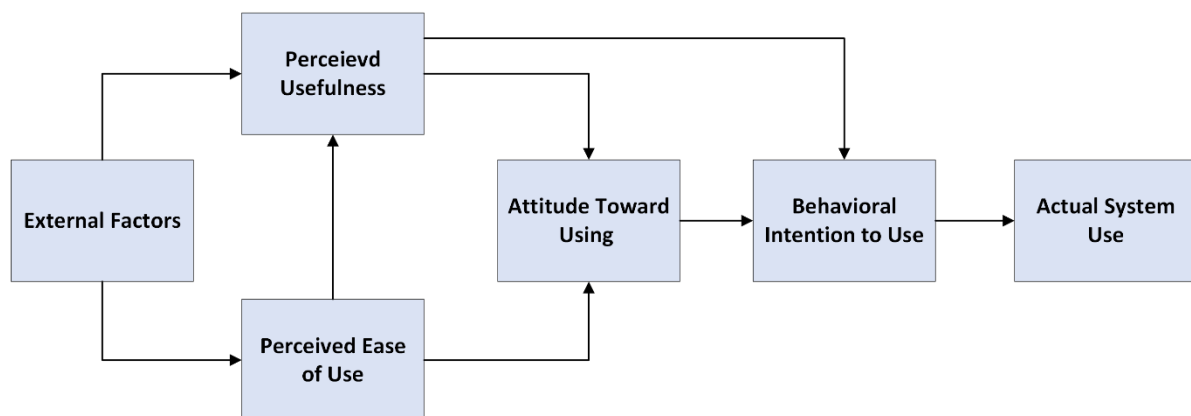
Identifying factors that lead to people's acceptance and use of technology is a persistent challenge. Several models have been developed in an attempt to shed light on factors that influence technology acceptance among intended users. These models have been assessed iteratively to determine their efficacy across a wide range of technological applications. Based on the psychological theory TRA, discussed in section 2.6 above, Davis developed a conceptual model for technology acceptance theory as part of a PhD dissertation (Davis, 1986). Later, in 1989, Davis developed a simplified version of the TAM. The model has attracted considerable research interest in the context of information systems, as it focuses on technology use and acceptance. It also has reliable instruments with excellent measurement properties and is empirically validated (King & He, 2006; Lu et al., 2003).

The TAM is an intention-based theory, meaning that it puts emphasis on the crucial component of intention in accepting and effectively adopting technology. This theory postulates that an individual's perception of the usefulness and ease of use of the technology in question predicts his or her attitude towards using it, which in turn predicts intentions to use (measuring technology acceptance) and usage behaviour (measuring actual use) (see Figure 1). In other words, TAM proposes that although they may be effectuated by other external factors, the perceived usefulness (PU) and perceived ease of use (PEU) are the primary predictors of the acceptance and adoption of information technology/information systems. Perception of

usefulness is defined as the extent to which an individual believes that using a particular system would enhance his or her job performance (Davis, 1989). Perception of ease of use is defined as the degree to which an individual believes that using a particular system would be effortless (Davis, 1989).

Figure 1

Technology Acceptance Model (TAM)



Note. Adopted from User acceptance of computer technology: A comparison of two theoretical models by F. D. Davis, R. Bagozzi, and P. Warshaw, 1989, *Management Science*, 35(8), p.985 (<https://doi.org/10.1287/mnsc.35.8.982>). Copyright 1989 by the Institute of Management Sciences.

Over the years, TAM has gone through multiple extensions including TAM2 (Venkatesh & Davis, 2000), unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003), and UTAUT2 (Venkatesh et al., 2012). The versatility of the TAM can be observed in the literature through its use for diverse samples of users and across a wide range of research fields including, but not limited to, telemedicine (Alaboudi et al., 2015; Kamal et al., 2020; Peixoto et al., 2022; Saigi-Rubió et al., 2016), health care technology (Portz et al., 2019; Rahimi et al., 2018), information systems (Taylor & Todd, 1995), electronic logistics information systems (Tung et al., 2008), online tax systems (Wu & Chen, 2005), online shopping systems/ e-commerce (Gefen et al., 2003; Gefen & Straub, 2000), and in educational

contexts (Granić & Marangunić, 2019). Additionally, TAM has been addressed in several meta-analyses including e-health acceptance (Chauhan & Jaiswal, 2017).

2.7.1.1 Health Technology & Technology Acceptance Model

Although the studies on TAM in the context of e-health and health informatics have shown that it is a powerful and robust model, other components come into play, and, hence, researchers often extend TAM by introducing other constructs (Chauhan & Jaiswal, 2017; Rahimi et al., 2018). Findings from research focusing on physicians' acceptance of electronic health care records have indicated that PU positively influences physicians' intentions to use the systems. In contrast, PEU was not reported to be a determinant of intention to use the systems (Ortega Egea & Román González, 2010). Another study investigating physicians' and nurses' acceptance of health information technology reported the "novel" finding that PU has no influence on intention to use the systems, while PEU directly influences acceptance (Ketikidis et al., 2012).

Similarly, studies looking at nurses as user types have presented conflicting findings of support (Aldosari et al., 2018) and rejection (Maillet et al., 2015) of the influence of PEU on technology acceptance. On the other hand, research focusing on patient users (Deng et al., 2018; Kamal et al., 2020) reported that both PU and PEU influence patients' intentions to use telemedicine. As an attempt to explain these contradictory findings, one might assume that patients prefer systems that will improve their health (i.e., that are useful) and that require less effort (i.e., are easy to use), especially when they are ill and vulnerable. Furthermore, patients come from a variety of educational backgrounds, age groups, and levels of technology experience. Conversely, type of technology, higher educational level (Ortega Egea & Román González, 2010), type of job, and other moderating factors may explain the insignificant role of PEU in the acceptance of technology among health professionals.

The primarily consistent findings among physicians (Ortega Egea & Román González, 2010), nurses (Tung et al., 2008), and patients (Kamal et al., 2020) imply that PU and PEU have a positive and direct influence on the intentions to use medical information systems. In addition, researchers reported that the strength of the casual relationships between the components of TAM is moderated by the type of user (Chauhan & Jaiswal, 2017). This may also explain the contradictory empirical evidence regarding the influence of PU and PEU in explaining technology acceptance in health care.

Studies investigating the applicability of TAM within SA have produced findings consistent with those in the literature. Patients and health care professionals are in agreement that PU and PEU are important factors that influence their intentions to use a mobile application to manage chronic disease (diabetes) (Alkhudairi, 2016) and to adopt e-government health applications (Bamufleh et al., 2021). Additionally, there is evidence that the adoption of telemedicine among Saudi citizens is influenced by their perception of its usefulness and ease of use (Yamin & Alyoubi, 2020).

2.7.1.2 Mental Health & Technology Acceptance Model

Mental illness may affect patients' perceptions of technology and, therefore, their acceptance of it (Nadal et al., 2020), which implies the need to devise technology acceptance measures that are condition specific. For instance, anxiety- and stress-related conditions are often accompanied by reduced positivity, which can adversely affect an individual's ability to control negative emotions (Hitchcock et al., 2017). Additionally, patients' personal and health information is considered private, especially when it comes to stigmatising ailments such as those related to mental health.

Reports show that technology acceptance in the context of mental health and health in general has been assessed in studies using inconsistent definitions and measurement criteria (Nadal et al., 2020). Nadal et al. conducted a scoping review of mobile health technology

acceptance based on definitions, models, and measurement and found that only a few interpretations of technology acceptance are in agreement with existing definitions. These findings are supported by another study, Wozney et al.'s (2015) systematic review of studies related to the use of technology for anxiety and depression. The reviewed studies focused primarily on the acceptance and adoption of technology. It should be noted, however, that most of the reviewed papers used self-developed questionnaires in testing technology acceptance, and none utilised TAM (Wozney et al., 2015).

Similar to other TAM studies focused on health, studies assessing acceptance and intentions to use TMH have also yielded inconsistent results among the different user types. Simms et al. (2011) conducted a study assessing clinicians' PU and PEU of TMH. The authors found that clinicians had a positive perception of the usefulness of TMH and were divided concerning its ease of use. Lack of trust among patients (establishing a trusting relationship between patient and clinician is difficult through TMH) and lack of training among clinicians on the use of TMH are reported as barriers to TMH acceptance and use (Simms et al., 2011). Furthermore, PU has been reported as the strongest predictor of future use of TMH by mental health providers (Bunnell et al., 2020; Lazuras & Dokou, 2016). However, PEU does not appear to influence health providers' intentions to use TMH, consistent with prior contradicting findings in previous TAM research.

Additionally, Monthuy-Blanc et al. (2013) utilised the TAM to shed light on components that may influence the perceptions and intentions of mental health providers with respect to telepsychotherapy (psychotherapy delivered via video conferencing). Their study makes the claim that attitudes and perceptions of TMH are commonly assessed using the TAM, which is not entirely accurate. Results of the study support the direct influence of PU on the intention to use TMH, and support the influence of PEU on the PU (Monthuy-Blanc et al., 2013). In their study, however, the direct influence of PEU on the intention to use TMH was not examined.

This is because Monthuy-Blanc et al.'s study is based on the original TAM, which does not assume a direct influence of PEU on intention to use technology, but instead implies that PEU may be an antecedent of PU (Davis, 1989), which is consistent with the findings of their study.

Meanwhile, the literature indicates that empirical studies of patient acceptance of TMH applications in relation to TAM are scarce, particularly in SA. Often, participants in these studies involve young adults or students who are not experiencing mental health problems. Among participant pools of this nature, PEU may not appear to be a relevant factor, based on the technology experience and tech-savvy nature of the young participants (Olson et al., 2011). An example of this is a study by Becker (2016) examining acceptance of mobile mental health applications among young adults in Germany, as well as a study by Lamela et al. (2020) studying acceptance of Internet-based psychological interventions within the Portuguese community (mean age was 27.09 years). Based on the results of both studies, PEU had no direct influence on the intention to use TMH. Additionally, contrary to the findings of Lamela et al., Becker (2016) reported that PU shows no significant effect on the intention to use mental health applications. Also, mobile applications were not found to be sufficient for treating mental disorders according to participants in the study.

Despite applicability of the TAM to research carried out in the health technology field, it is evident that it requires modification to better reflect different research contexts. After identifying gaps in the current research on TMH applications in SA, integrating the components: multidimensional trust, perceived stigma, subjective norms, and perceived usefulness and ease of use can provide a more comprehensive understanding of factors that influence Saudi adults' acceptance and intention to use TMH applications for seeking mental health care.

2.8 Summary

This chapter started by introducing mental health and its prevalence in SA. Next, factors of multidimensional trust and perceived social stigma were addressed in relation to the literature on TMH. The chapter then described the theoretical grounds on which the study is based. This included a review of its applicability in health technology and TMH. In this chapter, the literature review uncovered arguments for the integration of technological, social, and mental health-related factors accompanied by supporting and refuting evidence. Each section outlined gaps in the literature that provide the rationale for this study and set its focus and boundaries. The next chapter presents the research model and hypotheses.

Chapter 3- Hypotheses

3.1 Overview

The purpose of this chapter is to propose a conceptual research model that attempts to expound the influence of multidimensional trust, perceived stigma, subjective norms, and perceived usefulness and ease of use on the acceptance of and intentions towards using TMH applications among Saudi adults. The research model and hypotheses are discussed and presented in this chapter, drawing on existing theories from the literature. Finally, the chapter will conclude with a summary.

3.2 Development of the Research Model

This study focuses on understanding the influence of trust and its antecedents, perceived stigma, subjective norms, and perceived ease of use and usefulness on people's perceptions of and intentions to use TMH applications. The conceptual model is constructed based on the literature discussed in the previous chapter. The fundamental assumption is that trust and social factors play a role in people's perceptions and influence their intentions to use TMH applications.

The TAM (Davis, 1989) is relevant for this study because it has been used by many researchers to predict and justify factors that influence user perceptions of and decisions to adopt technologies (Granić & Marangunić, 2019; Marangunić & Granić, 2015; Portz et al., 2019; Turner et al., 2010), including health care services such as telemedicine (Baudier et al., 2020; Kamal et al., 2020). Building on the TAM, the study is able to explore other components that are more relevant to technology and mental health within the SA cultural context. This study identifies 10 components, and their relationships are discussed as they appear in the research model. Table 1 shows a summary of the definitions of each construct.

Table 1*Research Constructs and Their Definitions*

Construct	Abbreviation	Definition
Trust in the care organisation	TCO	The subjective belief that health care organisations will follow ethical laws and procedures and prioritize the needs of their patients (van Velsen et al., 2017; Yang et al., 2021)
Trust in the care professional (interpersonal trust)	TCP	The subjective belief that health care professionals act for the patients with the patients' best interests in mind (Montague & Asan, 2012; van Velsen et al., 2017; Yang et al., 2021)
Trust in the treatment	TT	The subjective belief that the treatment received through TMH applications is effective (van Velsen et al., 2017)
Trust in technology	TTech	The subjective belief that the technological elements of TMH applications are safe and secure (Montague & Asan, 2012; van Velsen et al., 2017; Yang et al., 2021)
Trust in TMH applications	TTMHA	The overall trust in TMH applications (van Velsen et al., 2017)
Perceived stigmatisation by others for seeking help	Stigma	People's perceptions of being stigmatised by those whom they interact with, for seeking psychological help (Vogel et al., 2009)
Subjective Norms	SN	People's perceptions that most people who are important to them think they should or should not use TMH applications (Fishbein & Ajzen, 1975; Venkatesh & Davis, 2000)
Perceived Ease of Use	PEU	The extent to which a patient believes that using TMH applications would be free of effort (Davis, 1989, p. 198; Venkatesh & Davis, 2000)
Perceived Usefulness	PU	The extent to which a person believes that using TMH applications would improve his/her mental health (Davis, 1989; Venkatesh & Davis, 2000)
Intention to Use	IU	The extent to which a person intends to use TMH applications

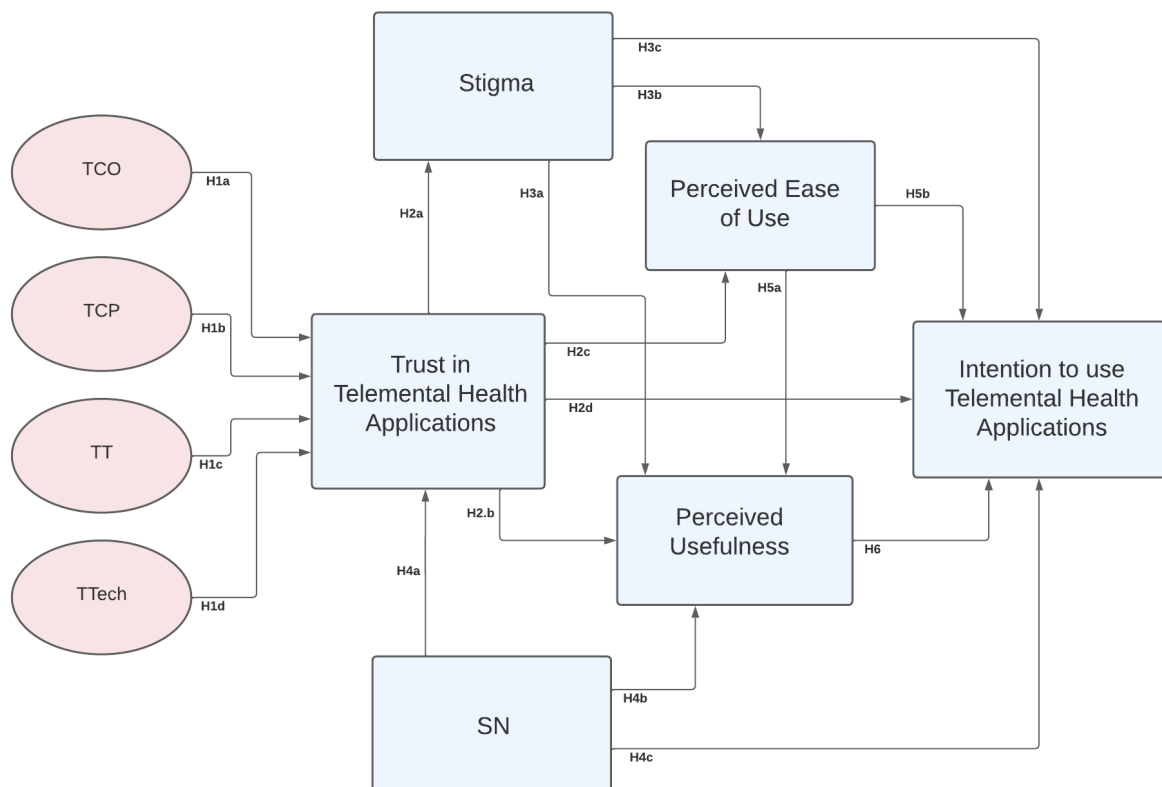
This research model predicts that people's overall trust in TMH applications is influenced by the dimensions/antecedents of trust: trust in the care organisation, trust in the care professional, trust in the treatment, and trust in the technology. People's intention to use TMH applications is influenced by trust in the applications, perceptions of stigma, subjective norms,

and perception of ease of use and usefulness of the applications. The study also predicts that trust in TMH applications positively influences the TAM constructs, PEU, and PU. Subjective norms and perceived stigma are predicted to also influence the PEU and PU of TMH applications.

The research model does not attempt to capture all possible factors that may influence the acceptance of and intention towards adopting TMH applications. Rather, it focuses on assessing the significance of multidimensional trust and social factors such as social stigma and subjective norms in the context of mental health applications in SA by building on the TAM. Figure 2 presents the integrated research model.

Figure 2

Research Model and Hypotheses



3.2.1 Multidimensional Trust

The use of TMH applications requires people to enter their personal, medical and financial information, all of which are considered very sensitive and private information. As a result, people's willingness to disclose such information is contingent on their disposition to trust (Ortega Egea & Román González, 2010) and their trust in telemedicine services such as TMH applications. This study draws on van Velsen et al.' (2017) multidimensional trust concept which proposes that patients' trust in telemedicine services is dependent on their trust in care organisations, health care professionals, treatment, and technology (van Velsen et al., 2017). Further, many studies (Ortega Egea & Román González, 2010; Peixoto et al., 2022; van Velsen et al., 2021; Yang et al., 2021) have established that trust is an essential element in telemedicine service acceptability; meaning that people with higher levels of trust are more likely to develop higher intentions towards adopting telemedicine services. These dimensions of trust collectively interact to influence people's help-seeking behaviours and intentions to use telemedicine services such as TMH applications.

3.2.1.1 *Trust in the Care Organisation*

The relevance of trust in the care organisation and its influence on the overall trust in TMH applications may be dependent on several factors, including the relative novelty of the applications (Atallah et al., 2018). Furthermore, in addition to running government supported telemedicine and TMH applications, private TMH applications are also available. People's reliance on private health care organizations has increased in SA (Yusuf, 2014). However, private health care has been reported to increase public mistrust (Gele et al., 2017; Mechanic, 1998). This is also found in a recent study in SA which reported that patients had lower levels of trust in physicians from the private health care sector when compared to physicians from the public health care sector (Aljaffary et al., 2021). Distrust in care organisations puts the patients

in vulnerable and stressful situations (Smith, 2017). It may weaken long-standing patient relationships (Zheng et al., 2017) and undermine help-seeking behaviours, and vice versa. A review of the literature revealed mixed and inconsistent support for the association between trust in the care organisation and overall trust of health care services (Smith, 2017; van Velsen et al., 2017, 2021; Yang et al., 2021).

The reality that people rely on health care organisations to fulfil their medical needs is often overlooked when discussing trust and health care. Trust in the care organisation is one of the subdimensions of trust that may be present in TMH application settings. It refers to the people's sense of safety and security resulting from guarantees and safety nets in place to ensure that the care organisation prioritises the individuals' needs while adhering to set laws and regulations. Therefore, to evaluate van Velsen et al.'s (2017) concept of multidimensional trust and to better understand the influence of trust in the health care organisation on people's overall trust in TMH applications this study hypothesises the following:

H1a. Trust in the care organisation has a positive influence on trust in TMH applications.

3.2.1.2 Trust in the Care Professional

Trust in the health care professional, also known as interpersonal trust, has been studied by scholars in both traditional health care and telemedicine (Anderson & Dedrick, 1990; Gogan et al., 2009; van Velsen et al., 2017, 2021; Yang et al., 2021). Interpersonal trust is fundamental to the patient–physician relationship. From a patient's perspective, interpersonal trust is shaped by the physician's credibility, competence, integrity, confidentiality, and professionalism (Brown et al., 2009; Kao et al., 1998; Norberg Boysen et al., 2017; Yang et al., 2021). In SA, Baudier et al.'s (2020) findings showed that competence of the “trust in the health care professional” dimension directly and positively influenced respondents' intentions towards

using telemedicine services. However, it can be argued that the lack of in-person interaction between patients and physicians may be seen as a threat to diagnostic accuracy and health professionals' competence. Research findings indicate that when it comes to mental health, diagnoses are often based on reviewing a patient's medical record (i.e., medical history) (Basco et al., 2000; Breton et al., 2021), meaning, physical examination is not always necessary.

Additionally, reports in the literature relay that trust in health care systems is often related to the care professional's interpersonal skills (Hall et al., 2001), which may suggest that people develop higher levels of trust in TMH applications as they observe the health care professional acting in their best interests. Therefore, this study also proposes the following hypothesis:

H1b. Trust in the care professional has a positive influence on trust in TMH applications.

3.2.1.3 *Trust in the Treatment*

Technology has become increasingly involved in medical treatments (Laugharne & Priebe, 2006). Not only is this true for mental health treatments but also to all medicine. Contrary to other types of medicine, mental health treatments are generally sought by patients voluntarily (Laugharne & Priebe, 2006). Therefore, it seems vital that patients have trusting attitudes towards treatments provided through TMH applications in order for them to actively decide to seek professional psychological help via those applications. In other words, if people trust that treatments provided through TMH applications are effective they may be more inclined to trust the applications and want to use them. Trust in mental health treatment could be an issue of greater importance in SA where traditional and spiritual treatments are often sought due to their preference over professional psychological help. To date, limited research has addressed peoples' trust in the treatment through TMH applications; however, research focusing on trust in telemedicine services presents trust in the treatment as an essential subdimension of the

overall trust in such platforms (van Velsen et al., 2021). TMH is no exception. Another study's findings indicate that trust positively influences the Saudi Arabian public's behavioural intentions towards using telemedicine applications for health care treatments (Bamufleh et al., 2021).

The conceptual characteristics of trust in mental health treatments has not been thoroughly explored in the literature (Brown et al., 2009), much less treatment provided through TMH applications. Moreover, current research on mental health mobile applications indicates that these applications lack clinically based therapeutic approaches and are not based on scientific evidence (Alqahtani & Orji, 2020; Wang et al., 2021). This, according to Alqahtani and Orji (2020), results in lower trust and low use. Conversely, TMH applications offer mental health treatment from certified and experienced mental health care professionals. Research suggests that mental health treatments delivered online with the guidance of a health care professional is as effective as conventional treatment (Philippe et al., 2022).

Trust in the treatment relates to people's perception of treatment effectiveness, treatment content clarity, and the ability to obtain a personalised treatment plan delivered through TMH applications. Research findings indicate that engaging patients in personalised treatment plans, for example, through decision-making, gives patients more control and, in turn, builds trust (Laugharne & Priebe, 2006; van Velsen et al., 2017, 2021). In light of this, trust in the treatment is likely to be a factor influencing the overall perception that people have on the trustworthiness of TMH applications. Hence, the following hypothesis is also proposed:

H1c. Trust in the treatment has a positive influence on trust in TMH applications.

3.2.1.4 Trust in the Technology

Trust in medical technology refers to people's perception of the tools and devices used to receive medical care as it relates to safety, security, and functionality. Existing concerns regarding anonymity, privacy, and stigma have led to patients' preference for online mental health treatments over face-to-face treatments (Wootton et al., 2011). Furthermore, telemedicine studies have highlighted the large effect of trust in the technology on the overall trust in the service and, as a result, its influence on the intention to use that technology (Montague & Asan, 2012; van Velsen et al., 2017, 2021; Yang et al., 2021). Given that trust in the technology is a factor contributing to people's overall trust in telemedicine services, resulting in its adoption, this study hypothesises that trust in the technology, through which TMH applications are used, will affect the overall trust in TMH applications.

H1d. Trust in the technology has a positive influence on trust in TMH applications.

3.2.2 Trust and Perceived Social Stigma

In the field of mental health, there is limited research investigating the correlation between stigma and trust (Brown et al., 2009; Verhaeghe & Bracke, 2011), much less in the context of TMH applications. It is important to understand that the perception of stigma is internalised, similar to one's sense of trust (Reiersen, 2017). Some individuals who have high perceptions of stigmatisation expect others to discriminate against them, look down on them, or see them as a danger to others, although this may not be true. Research findings indicate that even in the absence of actual stigma experiences, mental health patients may still have lower levels of trust in mental health services based on their internal perception of social stigma and self-stigma (Verhaeghe & Bracke, 2011). Furthermore, as discussed in Chapter 2, mental health is highly stigmatised in SA (Alattar et al., 2021; Jelaidan et al., 2018; Koenig et al., 2014), a stigma that

is often extended to patients' families (Corrigan et al., 2014). As a result, patients avoid seeking help or seek help secretly out of fear of negative reactions (Verhaeghe & Bracke, 2011). This suggests that stigma towards mental illness can hinder help-seeking behaviours and can result in low levels of trust in mental health services.

This, however, may not apply to TMH applications. Research findings have shown that the use of TMH reduces stigma (Aboujaoude et al., 2015). This could be explained, in part, by its enabling of remote access to mental health care, its confidentiality, and the ability to use it anonymously. Therefore, this study makes the argument that when people trust TMH applications, their perceptions of being stigmatised by those within their close social network will decline.

H2a. Trust in TMH applications has a negative influence on the perception of being stigmatised for seeking help.

3.2.3 Trust and the Technology Acceptance Model

Trust is an essential element in technology acceptance and the intention to use technology, and this has been recognised across a multitude of research fields including telemedicine (Baudier et al., 2020; van Velsen et al., 2017, 2021; Yang et al., 2021), digital health care (Abbas et al., 2018; Ortega Egea & Román González, 2010; Smith, 2017; Tung et al., 2008), online shopping (Gefen et al., 2003), mobile internet services (Alalwan et al., 2018), e-commerce (Pavlou, 2003), and online-tax systems (Wu & Chen, 2005). Medical technology studies have outlined the relationships between trust, PEU, PU, and intention to use telemedicine services and health care technology (Abbas et al., 2018; Baudier et al., 2020; Ortega Egea & Román González, 2010; Tung et al., 2008). The research findings show that trust positively influences PEU, PU, and intention to use a health care service. In addition, other

studies stressed the importance of building user trust to improve engagement with mental health applications and highlighted lack of trust as a barrier to their adoption (Torous et al., 2018). Therefore, given that trust is deemed valuable in mental health, human relationships, and technology, trust in TMH applications is likely to positively influence people's PEU, PU, and intention to use the applications to seek mental health care. Hence, the study hypothesises the following:

H2b. Trust in TMH applications has a positive influence on patients' perceived usefulness of TMH applications.

H2c. Trust in TMH applications has a positive influence on patients' perceived ease of use of TMH applications.

H2d. Trust in TMH applications has a positive influence on patients' intention to use TMH applications.

3.2.4 Perceived Social Stigma

The present study focuses on people's perception of the extent to which others in their immediate social circle would stigmatise them for seeking mental health treatment through TMH applications. Previous research report that stigma attached to mental illness often acts as a deterrent to people from seeking mental health treatment at the earliest opportunity (Goodwin et al., 2002; Marques et al., 2010). As a result, patients delay seeking treatment or seek treatment secretly in order to avoid possible stigmatising situations. However, unlike conventional seeking of mental health care, TMH applications offer access to psychological help without having to be seen in public and, hence, may limit possible public stigmatising situations, and mitigate the effect of perceived stigma when it comes to seeking help.

The literature includes different reports on the influence of stigma on the acceptance of technology offering mental health care. For instance, according to Levin et al. (2018), stigma does not prevent students from seeking treatment through self-help tools. In fact, in their study, students with higher levels of stigma tended to use self-help tools more often than those with lower levels (Levin et al., 2018). Additionally, there is research to suggest that the perceived stigma towards mental illness does not appear to be as significant a deterrent to seeking professional psychological help or using mental health services as what has been reported by other scholars (Golberstein et al., 2008).

On the other hand, in a study undertaken by Lamela et al. (2020), acceptance (perceived usefulness and ease of use) of internet-based psychological interventions was found to be significantly and negatively influenced by the personal stigma against depression. Furthermore, the findings of another study, which examined whether self-help tools such as mobile applications would increase the likelihood that college students would seek psychological help, showed that higher levels of stigma are associated with lower intentions to use self-help tools (Levin et al., 2018). This suggests that stigma negatively influences people's help-seeking behaviours regardless of the method used, that is, face-to-face or using a mobile application.

Considering findings in the literature that oppose the negative influence of stigma on technology acceptance, it is crucial to have a better understanding from a mental health perspective. People experiencing mental illness often face prejudice and discrimination from society and from within themselves (Corrigan & Rao, 2012). Internalising negative stereotypes about one's own mental illness can result in a lack of self-esteem and low self-efficacy (Corrigan & Rao, 2012). Furthermore, high perceptions of stigma can reduce the use of mental health care facilities. Hence, stigma can act as an intrinsic barrier to people's attitudes and perceptions of the value of TMH applications and their confidence in using the technology. Thus, although TMH applications present multiple benefits to eliminate stigma, one's internal

perceptions of being stigmatised for seeking psychological help may shield the individual from recognising the potential of the applications, consequently, negatively influencing their perceptions of the usefulness and ease of use, and intention to use TMH applications to seek mental health treatment. Hence, the following hypotheses are proposed:

H3a. Perceived stigmatisation by others for seeking help has a negative influence on the perceived usefulness of TMH applications.

H3b. Perceived stigmatisation by others for seeking help has a negative influence on the perceived ease of use of TMH applications.

H3c. Perceived stigmatisation by others for seeking help has a negative influence on the intention to use TMH applications.

3.2.5 Subjective Norms

The TRA contends that people's actual behaviour is directly influenced by their intentions, which, in turn, are influenced by their attitudes and subjective norms. Subjective norms predict people's behaviour, as they are influenced by the perceptions/opinions of those most important to them, for example, family, friends, physician, peers, and colleagues, even when one does not like or believe in doing the behaviour (Ajzen, 1991; Ajzen & Madden, 1986). The literature draws attention to the significance of subjective norms and how it can considerably alter user intentions and behaviour towards adopting technology (Kamal et al., 2020; Venkatesh & Davis, 2000).

The influence of subjective norms on mental health patients can be seen in Sweden (Piippo & Aaltonen, 2008), where the integrated network and family oriented model (INFM), which emphasises the psychological rather than medical principles, focuses on building patient trust

through involving patients' family members and other members of their social network, as well as their physicians, as part of their treatment. The research findings concluded that the INFM builds patient trust. The findings also suggest that mental health patients sometimes feel that they are influenced by others (Piippo & Aaltonen, 2008). Hence, with the focus on SA cultural subjective norms, it is thought that people with mental illness are much more likely to follow advice from those closest to them. If family and friends perceive TMH applications as effective, and are encouraging, the individual is likely to develop trust in the applications. Hence, this study hypothesises the following:

H4a. Subjective norms has a positive influence on patients' trust in TMH applications.

3.2.6 Subjective Norms and the Technology Acceptance Model

Subjective norms have been reported to influence the acceptance of technology through its PU (Schepers & Wetzels, 2007; Venkatesh & Davis, 2000). The influence of subjective norms on the PU in the literature is inconsistent. Some researchers view subjective norms as an antecedent of the PU, as reported by Venkatesh and Davis (2000). The assumption here is that people's intentions to accept technology is heavily influenced by those around them, subsequently resulting in an individual developing a sense of usefulness for the technology. Other researchers have reported no relationship between subjective norms and PU (Roberts & Henderson, 2000).

Similarly, conflicting reports exist in the literature for the influence of subjective norms on intention to use technology. A number of studies have found significant effects of subjective norms on intention to use technology (Kamal et al., 2020, 2020; King & He, 2006; T`aylor & Todd, 1995; Venkatesh & Davis, 2000). Conversely, other studies found no significant effect (Chau & Hu, 2002; Lau et al., 2001). Considering the contradictory findings regarding the

influence of SN on PU and intention to use technology, a closer look at the type of respondents, type of technology explored, and the country in which the data were collected can offer more insight (Schepers & Wetzels, 2007).

In this study, the focus is on seeking psychological therapy, advice, or treatment through TMH applications in SA. Considering the stigma associated with mental illness, and that stigma is often passed on to the patients' families, TMH applications may be perceived as useful to both the individuals and their families. Among mental health patients, those closest to them are often the ones who influence them; thus, they are more likely to perceive TMH applications as useful if they observe that their friends or family members have used the service and/or perceived it to be useful. Furthermore, research findings show that social influence (i.e., subjective norms) influences TMH acceptance (Lamela et al., 2020). As such, the study hypothesises the following:

H4b. Subjective norms has a positive influence on patients' perceived usefulness of TMH applications.

H4c. Subjective norms has a positive influence on patients' intention to use TMH applications.

3.2.7 Technology Acceptance Model

Both models TAM (Davis, 1989) and TAM2 (Venkatesh & Davis, 2000) present PEU and PU as antecedents of intention to use technology. Additionally, people's intention to use TMH applications is a crucial aspect of its success. For the purpose of this study, PU is redefined as people's belief that telemedicine services, including TMH, will be useful only if they result in faster delivery of health care services, lower costs, improved health record documentation, and time saving (Kitsiou et al., 2015).

Studies in information systems have indicated that among physicians (Ortega Egea & Román González, 2010), nurses (Tung et al., 2008), and patients (Kamal et al., 2020), PU and PEU play a critical and direct role in their intention to use medical technology. Moreover, there is stronger support for the indirect effect of PEU on technology acceptance, through PU (Gefen & Straub, 2000; Ortega Egea & Román González, 2010).

Researchers in TMH technology acceptance have reported inconsistent findings. Some findings highlight the positive influence of the PU on people's intentions to adopt technology (Lamela et al., 2020), while others show no significant influence (Becker, 2016). Further, while some studies argue the importance of the PEU of technology for people experiencing mental illness and in vulnerable or uncertain situations (Molfenter et al., 2021), others found no significant influence of the PEU on people's intentions to adopt TMH technology (Lamela et al., 2020). To better understand such conflicting findings, a closer look into mental illness and how it can impair people's acceptance of technology is important.

Mental illness has been shown to result in hopelessness and negatively influence people's outlook on life (Andresen et al., 2003, 2006; Hitchcock et al., 2017). When people feel hopeless about life as result of a mental illness, it can be argued that they may also feel hopeless about treatment regardless of the method used, which can result in low perceptions of the usefulness of technology, including TMH applications. Additionally, as presented in section 3.2.6 above, mental illness can negatively influence people's self-efficacy, meaning that people are likely to doubt their capabilities to use technology. Further, some mental illnesses can result in poor concentration levels, such as depression (Mayo Clinic, 2022). As a result, using technological tools may be perceived as more difficult when combined with a mental illness, which may result in people perceiving TMH applications as not easy to use and, hence, negatively influence their use intentions. On this basis, it is hypothesised that people will accept and use

TMH applications if their use is believed to be of less effort and will result in better-quality health care service.

To give a better understanding of the influence of PU and PEU on people's intentions to use TMH applications the following hypotheses will be assessed:

H5a. Perceived ease of use has a positive influence on patients' perceived usefulness of TMH applications.

H5b. Perceived ease of use has a positive influence on patients' intention to use TMH applications.

H6. Perceived usefulness has a positive influence on patients' intention to use TMH applications.

3.3 Summary

This chapter presented the research model developed by combining the literature on trust and perceived stigmatisation and building on the well-established theories: TAM and TRA. The research model integrated the TAM constructs (PEU, PU, and intention to use), social constructs (subjective norms and perceived stigma), and the multidimensions of trust (trust in the care organisation, trust in the care professional, trust in the treatment, and trust in the technology). Following that, a discussion of the hypothesised relationships between the factors was presented in relation to TMH applications. The next chapter describes the research methodology design with the goal of identifying what factors influence patients' intentions to use TMH application.

Chapter 4- Methodology

4.1 Overview

A detailed description of the methodology adopted in this study is provided in this chapter alongside a description of the study's target participants and the mechanisms used to recruit them. The process for developing the questionnaire is then described in detail. This includes examining the existing instruments used and the process for translating the questionnaire from English into Arabic. This chapter also discusses SA's and New Zealand's ethical considerations and approvals. The chapter concludes with a discussion of the data analysis method used, PLS-SEM.

4.2 Study Design

Developing a study design is considered one of the most important steps in the process of conducting research. Essentially, the objective of constructing a research design is to ensure that the collected data enable the researchers to answer the research questions as accurately as possible (de Vaus, 2001). When developing a research design, researchers are able to focus their attention on the specified research topic, research questions, and the recruitment strategy. It was argued by de Vaus (2001) that failing to address these issues in the beginning phases of research may lead to weak conclusions that do not answer the research questions.

This is an exploratory, cross-sectional study, in which data were collected from individuals in a specific population subgroup at a specific point in time then analysed to answer the focus questions of the research (de Vaus, 2001; Mann, 2003; Rezigalla, 2020). This method is primarily used to gain a deeper understanding of the perceptions from a particular group of people. As such, the present study used an exploratory descriptive method to explain how people's intentions to use TMH applications in SA are influenced by factors such as multidimensional trust, perceived stigma, subjective norms, PEU, and PU. A cross-sectional research design was more appropriate for this study because it allows for an effective approach to identify multiple relationships and for testing the research hypotheses.

Ethical approvals were obtained from the Scientific Research Ethics Committee in SA in June 2021, (Approval no., HAO-02-T-105) and the Auckland University of Technology Ethics Committee in August 2021, (Approval no., 21/256). Please refer to Appendix A for ethical approvals.

4.3 Participants

The data collected for this study aimed at understanding people's perceptions of and intentions towards using TMH applications in SA. The study investigated the influence of multidimensional trust, perceived stigma associated with mental illness, subjective norms, PEU, and PU on people's intentions to use TMH applications. Participants in this study were members of the general SA population who were 18 years of age or over. The study did not use data collected from participants under 18 years of age. The inclusion criteria were as follows: people who are users of TMH applications, people seeking mental health care on behalf of other individuals such as family members and professional caregivers, or members of the general SA public. Participants who reported using TMH applications that are not available in SA had their data excluded from analysis.

In surveys, data are collected through sampling from the population with the aim of generalising the results to the entire population. However, there are limitations to the generalisability of the results obtained from the sample in this study. Initially, the study focused on recruiting mental health patients and users of TMH applications in SA. Later, as a result of the COVID-19 pandemic, low response rate, and time constraints the participant pool was expanded to include the general SA public. Furthermore, internet users were the target participants in this study due to the use of an online, self-reported survey to collect data; meaning that only those with access to a device and an internet connection were able to participate in the study.

4.4 Recruitment Procedure

Participant recruitment was accomplished using an anonymous online questionnaire. Invitations, containing a brief description of the study and a link to the online survey, were published on social media outlets (Twitter, Facebook, and WhatsApp) and also sent via email to personal and professional networks (see Appendix B). As an additional measure, TMH application providers were emailed the study survey and asked to forward it to their users. Further, participants were also asked to share the survey with their personal contacts. The survey was administered via the survey management system Qualtrics.

The participant information sheet (Appendix C) appeared at the beginning of the survey after the person clicked on the survey link in order to participate. It informed participants that their participation in the study was completely voluntary, that they could voluntarily opt out at any time, and that their answers would not be recorded or used in the study. Moreover, all questions related to the study and were non-identifying to ensure a high degree of confidentiality. At the end of the participant information sheet, participants were informed that by commencing the survey, they would be giving their electronic consent to participate in this study.

4.5 Measures

Survey questions were derived from existing validated instruments measuring the multidimensions of trust, perceived social stigma, subjective norms, PEU, PU, and intention to use TMH applications. In view of the fact that Arabic is the primary language spoken in SA and among the focus sample, the language adopted in the survey was Arabic. Initially, the survey instruments were compiled, designed, and written in English. The questions were then translated from English into Arabic by a professional translator, then back-translated to ensure

accuracy of the questions. Further, to provide a more accurate assessment of the participants' views, the questionnaire was rated on a 7-point Likert scale (Finstad, 2010). For improved clarity and understanding of the survey, each section was preceded by a definition of terminology and explanation of the context of the survey questions. See Appendix C for the English and Arabic questionnaires.

All questions were required to be answered, and participants were prompted to complete all questions. Once all questions were answered, participants were able to submit their responses. Participants were not compensated in any way for their participation in this study.

The survey comprised 55 questions divided into four sections. The first section covered questions on demographics. Section two consisted of questions related to social influences. The third section consisted of questions examining the multidimensions of trust. The final section included questions on technology acceptance. The survey included three questions related to the use of TMH applications in the first section. These questions aimed to obtain information about the names of the TMH applications used, frequency of use, as well as the type of visits, for example, therapy or psychiatric intervention. These questions only pertained to participants who reported having used TMH applications. Participants were directed to the end of the survey after completing the questionnaire and thanked for their contribution. Finally, using the features available on the Qualtrics survey platform, participants were prevented from attempting to complete the survey more than once.

4.5.1 Demographic Survey Questions

Demographic questions were included in this section to gather information about participants' age, gender, ethnicity, marital status, highest level of education, monthly income, region of residence in SA, and use of TMH applications. In instances where participants

indicated that they had previously used a TMH application, three additional questions related to application name, frequency of use, and type of visits were asked before proceeding to the next section. In all other instances, participants were directed to the next section of the questionnaire.

4.5.2 Trust

This study aimed to investigate the multidimensions of trust in TMH applications. Therefore, the fourth and largest section of the study survey measured the level of trust in TMH applications using the Patient Trust Assessment Tool (PATAT) (van Velsen et al., 2017). This tool uses a total of five subscales that measure trust across different factors that shape patient trust in telemedicine services. The PATAT measures all items on a 5-point Likert scale, where 1 represents *disagree*, and 5 represents *agree*. However, for this study, all items in this instrument were measured on a 7-point Likert scale ranging from 1 *strongly disagree* to 7 (*strongly agree*).

4.5.2.1 Trust in the Care Organisation

The subscale, trust in the care organisation, consisted of five items (e.g., Item 5 stated “At [Care Organisation], they take my specific needs into account,” which was rephrased to read, “TMH organisations take my specific needs into account”). The items relate to the reputation of the organisation providing TMH application services, how the organisation deals with problems that occur when using their services, and if people feel safe using the organisation’s application. Items were summed up to give a total score ranging from a minimum of 5 to a maximum of 25. Higher scores indicate greater levels of trust in the care organisation offering TMH application services.

4.5.2.2 *Trust in the Care Professional*

A total of four items were included in this subscale, which investigates trust in the care professional. The items focused on people's tendencies and trust to follow health care professionals' advice and their perceptions of health care professionals' capability to provide good medical care, (e.g., Item 4 stated, "I always follow my [doctor's] advice"). This item was revised for the study at hand to state, "I always follow my therapist's advice." Items were summed up to give a total score ranging from a minimum of 4 to a maximum of 20. Higher scores indicate greater levels of trust in the care professional.

4.5.2.3 *Trust in the Treatment*

Under the trust in treatment subscale, the study focused on the quality, clarity, and effectiveness of treatment. Furthermore, this subscale addressed the interaction and collective decision-making between patient and therapist when using the TMH application platform to receive a treatment plan. The subscale consisted of five items, one of which is negatively worded (e.g., Item 4 stated, "The treatment I received is not helping me enough"). All other items in this subscale were positively worded. For analysis, Item 4 was reverse coded. Items were summed up to give a total score ranging from a minimum of 5 to a maximum of 25. Higher scores indicate greater levels of trust in the treatment received through TMH application platforms.

4.5.2.4 *Trust in the Technology*

Trust in the technology refers to a patient's belief that using a TMH application is safe and secure. This section consisted of five items aimed at assessing trust in the technology used including user anonymity, data security, and technical safeguards that ensure a safe environment for use. For instance, Item 3 stated, "The personal information that is stored at

[the website] will not get lost,” which was revised to better suit the context of the study to read, “The personal information that is stored on TMH application will not get lost.” Items were summed up to give a total score ranging from a minimum of 5 to a maximum of 25. Higher scores indicate greater levels of trust in the technological aspects of TMH applications.

4.5.2.5 Trust in Telemental Health Applications

Trust in TMH applications refers to the holistic notion of trust. Five items were in this subscale, three of which were adopted from Ruyter et al.'s study (2001) and were adapted for this study to assess the overall trust in TMH applications. One of the items was presented negatively as follows: “I can trust this service less than other online services, such as Bol.com and the website of my municipality,” which was represented in this study as, “I can trust TMH applications less than other online services.” This negative item was later reverse-coded for data analysis. Items were summed up to give a total score ranging from a minimum of 5 to a maximum of 25. Higher scores indicate greater levels of overall trust in TMH applications.

4.5.3 Perceptions of Stigmatisation by Others for Seeking Help

Stigma measures were adapted from the stigma scale, Perceptions of Stigmatization by Others for Seeking Psychological Help (PSOSH) (Vogel et al., 2009). The PSOSH scale measures the degree to which individuals believe that those with whom they interact would stigmatise them if they sought professional psychological help. To answer the survey questions in their study, Vogel et al. (2009) presented the items as follows: “Imagine you had an academic or vocational issue that you could not solve on your own. If you sought counselling services for this issue, to what degree do you believe that the people you interact with would __,” which for the purpose of this study was rephrased to say, “Imagine you had an issue with your mental

well-being and you could not solve this issue on your own. If you sought counselling services for your mental well-being, to what degree do you believe that people you interact with would ____.” The scale comprised five items, such as “React negatively to you.” that were measured on a 5-point Likert scale (1= *Not at all*, 2= *A little*, 3= *Some*, 4= *A lot*, and 5= *A great deal*). Items were summed up to give a total score ranging from a minimum of 5 to a maximum of 25. Higher scores indicate greater perceptions of stigma from those closest to the person seeking psychological help. The scale showed good internal consistency and test–retest estimates (Dempster et al., 2013; Riggs et al., 2021). It was also found to be similar to other existing measures of stigma and help-seeking behaviours (Vogel et al., 2009).

4.5.4 Subjective Norms

Subjective Norms refers to the perception that most people who are important to an individual think he or she should or should not use innovative technology (Venkatesh & Davis, 2000), in this case, the use of TMH applications.

The TRA formed the basis for subjective norms. According to the TRA, subjective norms is one of the factors that determine an individual’s intention to perform a behaviour. The notion of subjective norms was also stressed by Taylor and Todd (1995) as a crucial factor that determines intentions to use technology.

A literature search was performed to identify existing scales that have been developed for measuring subjective norms. The scales were evaluated and selected for this study based on their validity and reliability. As a result, subjective norms was found to be a key element in many extensions of the TAM such as TAM2 (Venkatesh & Davis, 2000), UTAUT (Venkatesh et al., 2003), and UTAUT2 (Venkatesh et al., 2012). These theories discuss subjective norms as a form of social influence on technology acceptance and adoption. Across reported studies

and a range of time periods, the Cronbach's alpha reliability ranged from .81 to .94 (Venkatesh & Davis, 2000).

The subjective norms scale consisted of two items measured on a 5-point Likert scale, where 1 represents *Disagree* and 5 represents *Agree*. However, to maintain consistency throughout the survey and to gain better understanding of respondents' responses, a 7-point Likert scale, where 1 represents *strongly disagree* and 7 represents *strongly agree* was used. This study adopted both items, as "People who influence my behaviour think I should use TMH apps," and "People who are important to me think that I should use TMH apps." Items were summed up to give a total score ranging from a minimum of 2 to a maximum of 14. Higher scores indicate greater perceptions of the influence of subjective norms on the individual's use of TMH applications.

4.5.5 Technology Acceptance Model

This last section measured the participants' acceptance of TMH applications. This scale was adapted from the widely used TAM (1989), which consists of questions relating to the PU and PEU of technology. The scale also included questions relating to participants' intentions towards using the technology. This instrument was shown to have high reliability, validity, and strong psychometric characteristics. The TAM presents both PU and PEU as predictive of the attitude towards using a system, which, in turn, influences people's intention to adopt it. Davis (1989) accompanied the instrument with a 7-point Likert scale, where 1 represents *extremely likely*, and 7 represents *extremely unlikely*. This study also used a 7-point Likert scale to measure the TAM constructs; however, for the study 1 represented *strongly disagree* and 7 *strongly agree* to ensure consistency throughout the questionnaire.

4.5.5.1 *Perceived Ease of Use*

The adopted scale consisted of six positively worded items measuring the PEU, as originated in the works of Davis (1989). Cronbach's alpha reliability for the PEU subscale according to Davis was .91, and a slightly higher figure resulted when applied to medical information systems, 0.93 (Melas et al., 2011). The items were adapted to meet the study objectives. For example, Item 1 stated, "Learning to operate CHART-MASTER would be easy for me." This study presented this item as "Learning to use TMH apps is easy for me." For data analysis, the six items were added to produce a score, which ranged from 6 to 42. Higher scores indicate high perceptions of ease of use of TMH applications among participants.

4.5.5.2 *Perceived Usefulness*

Measured in this scale were six positively worded items focusing on the PU of TMH applications. Cronbach's alpha reliability for the PU subscale was .97 (Davis, 1989), and when applied to the medical information systems field was .92 (Melas et al., 2011). The items were reworded to align with this study's objectives. For example, PU Item 3 stated, "Using CHART-MASTER in my job would increase my productivity," and for this study was presented as "Using TMH apps in my health management regimen better my treatment." A score ranging from 6 to 42 was derived by summing up the six items; higher scores indicate that the participant perceives TMH applications to be useful.

4.5.5.3 *Intention to Use*

Actual use of a system is predicted by the intention to use it (Mathieson, 1991). Intention to use is explained by both theories, TAM and TRA. It is also determined by the direct and indirect influence of PU and PEU (Taylor & Todd, 1995). Empirical tests show that the TAM justifies a great portion of the intention to use and self-reported use. The intention to use is measured

using items adapted from the TAM and its extensions (Davis, 1989; Davis et al., 1989; Venkatesh & Davis, 2000). Cronbach's alpha reliability ranged from .82 to .97 across studies (Venkatesh & Davis, 2000). Two items were used to measure intention to use. For example, Item 2 stated, "Assuming I have access to the system, I intend to use it," and in this study's survey it was presented as, "Assuming I have access to TMH apps, I intend to use it." The items were rated on a 7-point Likert scale. Upon analysis of the data, the values were added up to give a total score ranging from 2 to 14. Higher values indicate greater intentions to use TMH applications.

4.6 Translation Procedure

The final set of adopted measures was translated from English into Arabic using a forward-backward translation technique (Brislin, 1970). First, the survey was translated into Arabic by two independent translators, who are both fluent in Arabic and English. As a second step, the primary researcher, who is also a fluent speaker of Arabic and English, reviewed both Arabic translations and discussed inconsistencies with each translator independently. Third, the approved Arabic translation was sent to a third translator to back-translate the survey questions from Arabic into English. Finally, the primary researcher compared the forward and backward translations to ensure the questions were equivalent and did not cause cultural sensitivity.

4.7 Data Analysis

4.7.1 Introduction to Structural Equation Modelling

Structural equation modelling (SEM) is a multivariate analysis method that provides robust frameworks used for assessing theories and research concepts (Hair et al., 2011; Hair Jr et al., 2014). SEM can be used to analyse complex relationships between multiple variables (Beran & Violato, 2010), including hypothetical and unobserved latent variables. Further, SEM demonstrates the ability to handle measurement error, which some consider to be its major advantage. The SEM analytical method has been applied in a variety of research fields including, but not limited to, social (Hair et al., 2011; Shaheen et al., 2017), medical (Beran & Violato, 2010), psychological (Martens, 2005; Raykov et al., 1991), and marketing research (Chin et al., 2008).

SEM can be broadly divided into two types of analyses (Fornell & Bookstein, 1982; Hair et al., 2011; Hair Jr et al., 2014; Lowry & Gaskin, 2014): The first analytical approach is the widely applied covariance-based SEM (CB-SEM), which uses software packages such as Amos and LISREL. The second analytical approach is the partial least squares SEM (PLS-SEM), also known as PLS path modelling (Hair Jr et al., 2017), which uses software packages such as WarpPLS and SmartPLS. There are key differences between the two statistical analysis approaches; thus, when selecting either method, it is important to follow the rules of thumb. Table 2 lists the criteria that should be considered when deciding between CB-SEM and PLS-SEM.

Table 2*Rules of Thumb for Selecting CB-SEM or PLS-SEM*

Evaluation criteria	CB-SEM	PLS-SEM
Research goals	Testing, confirming, or comparing theories	Predicting key constructs Exploratory research or an extension of an existing theory
Measurement model specification	Model is correctly specified including the selection and linking of the appropriate variables	Model is not correctly specified Ability to use formative constructs as part of the model
Structural model	Non-recursive	Complex structural model consisting of many constructs and indicators
Data characteristics	Large sample size Data distribution is normal Data meets distributional assumptions	Relatively small sample size Minimum sample size must be 10 times the largest number of observed variables used to measure one latent variable, or 10 times the largest number of structural paths pointing to a construct in the structural mode. Skewed data distribution
Model evaluation	Ability to test for measurement model invariance. Global goodness of fit	Ability to use latent variable scores in subsequent analyses. Global goodness of fit

Notes: CB-SEM, covariance-based structural equation modelling; PLS-SEM, partial least squares structural equation modelling. Adapted from “PLS-SEM: Indeed a silver bullet,” by J. Hair, C. M. Ringle, M. Sarstedt, 2011, *Journal of Marketing Theory and Practice*, 19(2), p. 144 (<https://doi.org/10.2753/MTP1069-6679190202>).

In this study, PLS-SEM was the most appropriate data analysis method to use, given the above guidelines and based on the following criteria:

- 1- The study focuses on predicting key factors influencing the use of TMH applications among the Saudi people.
- 2- The study draws from and examines existing theories and literature.
- 3- The research model is complex and includes many constructs and indicators (Hair et al., 2019; Hair Jr et al., 2017).

- 4- The data distribution is skewed, and the data sample is relatively small.

4.7.2 Partial Least Squares Structural Equation Modelling

PLS is a statistical technique, originally developed by Wold (1974, 1980, 1982) that aims to maximise the explained variance of dependant latent variables. PLS-SEM data analysis involves two separate model analyses. To begin, the measurement model is assessed, then the structural model (Hair et al., 2011; Hair Jr et al., 2017). PLS path models are composed of two components (Hair Jr et al., 2017). The first is the structural model, also known as the inner model, which consists of the constructs and their respective paths in the model. The second is the measurement model, also known as the outer model, which consists of the constructs and their corresponding observed variables.

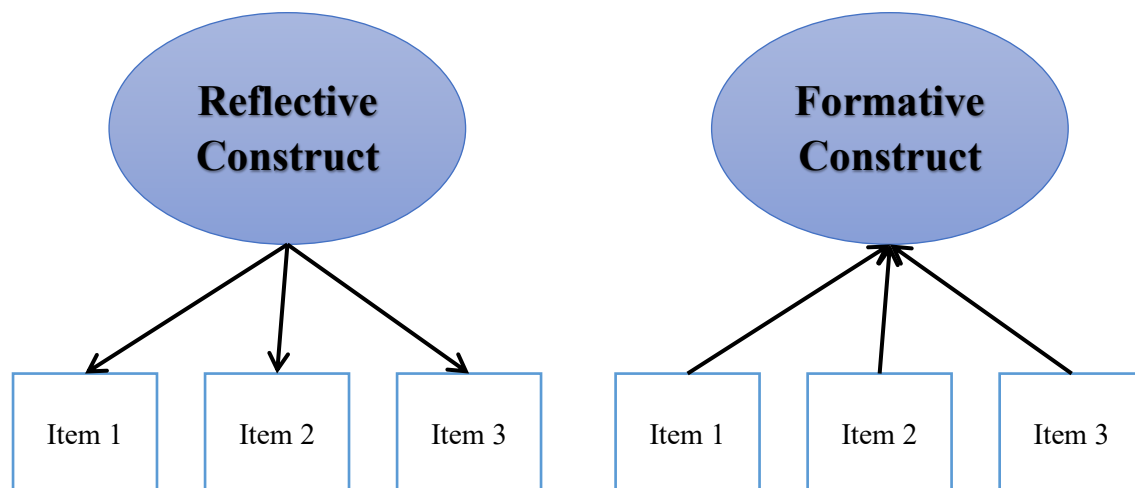
It is necessary to define and explain the terminologies used throughout this section in order to provide a better understanding of PLS-SEM data analysis. *Items*, also referred to as indicators, measures, or observed variables, are the data scores that are collected through self-reported surveys or other empirical procedures (Edwards & Bagozzi, 2000). Their purpose is to assess the *constructs*, which are concepts that explain a theoretical interest and are also referred to as latent variables (Hair Jr et al., 2017).

There are two types of constructs. *Exogenous latent variables* are constructs that are not influenced by other constructs but rather affect/explain other constructs in the model. Endogenous latent variables are the constructs that are influenced and explained by other constructs within the model. Each construct can have its own measurement model with its indicators (Hair Jr et al., 2017). The *indicators* used to measure a construct can be either *reflective* or *formative* (Petter et al., 2007). Reflective items are those that assume that the construct is what causes the indicator variables to be measured. Eliminating a reflective

indicator will not change the essence of the underlying construct (Hair Jr et al., 2017; Petter et al., 2007), and the items must be highly correlated (Chin, 1998a; Hair Jr et al., 2017; Petter et al., 2007). In SmartPLS, the direction of the arrows within the outer model is from the construct to the indicators (Hair Jr et al., 2017); refer to Figure 3. On the other hand, formative items assume that the items determine the construct (Petter et al., 2007). Eliminating a formative indicator eliminates part of the underlying construct, and it is not necessary for the formative items to be correlated or to have a high internal consistency (Chin, 1998a; Petter et al., 2007). In SmartPLS, the direction of the arrows within the outer model is from the indicators to the construct (Hair Jr et al., 2017); refer to Figure 3. This study is modelled based on a formative measurement model. This is because the outer model consists of all formative items.

Figure 3

Diagram of Reflective and Formative Constructs



4.7.3 Common Method Bias

PLS-SEM refers to common method bias as the systematic variance shared across the variables, which is the result of the measurement method rather than the variables that are measuring the constructs (Tehseen et al., 2017), for example, the respondents' perceptions and behaviours in relation to various topics, and the questionnaire instructions given to participants at the beginning of a survey (Kock, 2015; Tehseen et al., 2017). Considering this study used data obtained through a one-time survey from individual participants, it is necessary to evaluate the common method bias. In the present study, the full collinearity test of PLS-SEM was conducted to assess potential method bias (Kock, 2015). To establish that data are free from common method bias, the variance inflation factor (VIF) values should not exceed 3.3 (Hair et al., 2019; Kock, 2015). Alternatively, if the model contains any value above the threshold, then it is considered affected by common method bias.

4.7.4 Control Variables

A standard practice in questionnaire-type studies is analysing the theoretical variables in the structural model with control variables (Kock et al., 2008; Spector & Brannick, 2011). Generally, control variables are not considered components of the theory being tested or the hypothesised relationships (Spector & Brannick, 2011). However, the possibility of control variables affecting the theoretical variables of the study must be evaluated in order to identify or exclude other effects.

The present study's questionnaire contained demographic questions concerning age, gender, nationality, education, marital status, income, region, and use of TMH applications. The covariates were added to the structural model as independent variables. The relationship between all the covariates and the theoretical variables (trust in TMH applications, perceived

stigma, subjective norms, PEU, PU, and intention to use) was tested using SmartPLS to determine the path coefficient values and significance of relationships.

4.7.5 Measurement Model Analysis

As indicated in section 4.7.2 above, PLS-SEM consists of a two-step procedure to evaluate the research model, the first being the measurement model assessment which focuses on each item as it relates to a construct being measured in relation to the item's internal consistency, reliability, validity, convergent validity, and discriminant validity (Hair et al., 2011, 2019; Hair Jr et al., 2017; Lowry & Gaskin, 2014). In order to evaluate the measurement model, a distinction between reflective and formative constructs has to be established (Hair Jr et al., 2017; Henseler et al., 2016; Petter et al., 2007). The reason for this is that reflective measurement models are assessed based on internal consistency (using the composite reliability [CR]), convergent validity (reliability and average variance extracted [AVE]), and discriminant validity. As for formative measurement models, they are assessed based on convergent validity, collinearity, and the outer weights (Hair Jr et al., 2017). Among the measurement models evaluated in this study, all were considered reflective and were assessed based on the reflective model assessment guidelines since the study's research model did not include any formative constructs.

4.7.5.1 Internal Consistency Reliability

Assessing reflective constructs begins with inspecting the outer loadings of each manifest variable. Outer loadings reflect the overall input of each manifest variable to the construct it represents. In PLS-SEM, the outer loading range is from 0 to 1. The measurement model becomes more reliable as the loading values increase. In other words, the closer the outer

loading is to 1.00, the more reliable it is. Values of .708 and above are recommended (Hair et al., 2019), since they indicate that the construct explains more than half of the variance of the item. Reflective indicators with low outer loadings suggest that the relationship with the construct is insignificant. Outer values of .6 are acceptable for exploratory research. It is advised to drop an observed variable with outer loading in the .4 to .7 range on the condition that doing so results in better CR scores. However, observed variables with low outer loading values below .4 should always be eliminated (Hair Jr et al., 2017).

PLS-based research uses CR as a means of measuring internal consistency reliability of reflective latent variables (Hair Jr et al., 2017). When compared with Cronbach's alpha, CR reports a truer validity (Hair Jr et al., 2017). CR values range from 0 to 1: the higher the value the more the reliability. Values less than .6 are considered invalid. Values of .6 and above are acceptable for exploratory research. On the other hand, values greater than .95 indicate very high reliability, which, in turn, could mean that the observed variables of the construct being assessed are very similarly phrased and do not fully represent the construct (Hair et al., 2019).

The measurement model analysis uses the AVE to test the convergent and divergent validity of the outer model. The AVE value must be greater than .5 (Chin, 1998b; Hock & Ringle, 2006). Values less than .5 indicate that the error variance exceeds the explained variance (Fornell & Larcker, 1981).

4.7.5.2 Convergent Validity

An observed latent variable's convergence validity is the degree to which it correlates positively with other observed latent variables measuring the same construct (Hair Jr et al., 2017). Items measuring a reflective construct are viewed as alternative ways to measure that same construct. Thus, items of a particular reflective construct are expected to have high level

of convergence. To clarify this, the indicators' outer loadings and the AVE values are evaluated (Hair Jr et al., 2017).

High outer loading values of a set of items associated with a construct reflect that the items are similar and are measuring the same concept. Each item should have an outer loading of greater than .708 to be statistically significant (Hair Jr et al., 2017). Items holding an outer loading value between .40 and .70 should be eliminated if doing so increases the CR or AVE values. Items with values less than .40 should be eliminated from the scale (Hair et al., 2011; Hair Jr et al., 2017).

AVE is defined as “the grand mean value of the squared loadings of the indicators associated with the construct” (Hair Jr et al., 2017, p. 138). A construct's AVE score of .5 or greater indicates that it accounts for over half of the variance of its items. On the other hand, scores of less than .50 suggest that a greater proportion of variance is explained by item errors than by the construct (Hair Jr et al., 2017).

4.7.5.3 Discriminant Validity

The outer model discriminant validity is assessed to determine if the constructs uniquely measure the target concept and that no other construct, in the research model, measures that specific concept (Hair Jr et al., 2017). Traditionally cross-loadings and the Fornell-Larcker criterion are used to measure the discriminant validity. However, studies have criticised both methods' ability to establish discriminant validity (Hair Jr et al., 2017; Henseler, Ringle, & Sarstedt, 2009). These researchers reported that neither method could reliably detect discriminant validity problems (Hair Jr et al., 2017; Henseler, Ringle, & Sarstedt, 2009).

Therefore, Henseler et al. (2016) advocated using the heterotrait-monotrait ratio (HTMT) to evaluate the discriminant validity of constructs as a solution. HTMT is an estimate of the

average (mean) correlation of items across constructs measuring different constructs compared with the mean of correlations of items measuring the same construct (Hair Jr et al., 2017; Henseler, Ringle, & Sarstedt, 2009). HTMT values near 1 indicate lack of discriminant validity; however, when constructs are conceptually identical, a threshold of 0.9 is acceptable. Values less than or equal to 0.85 are an indication that the model established discriminant validity (Hair Jr et al., 2017).

4.7.6 Structural Model Analysis

Once the measurement model assessment is deemed satisfactory, the next step is to assess the structural model in a systematic manner: in other words, the structural model must be evaluated in the order in which the steps are listed (Hair et al., 2019; Hair Jr et al., 2017; Henseler et al., 2016). Standard evaluation of the structural model includes assessing collinearity, path coefficients (relationships between constructs), coefficient of determination (R^2 value), effect size (f^2), predictive relevance (Q^2), and model fit.

4.7.6.1 Collinearity Assessment

The first step of the structural model assessment is testing for collinearity issues between each set of predicting constructs. The objective of this step is to ensure that the regression results are not distorted by collinearity within the structural model (Hair et al., 2019; Hair Jr et al., 2017). In SmartPLS, a measure of collinearity is VIF. Variance inflation factor values are calculated using the PLS algorithm function. This is achieved using the latent variable scores of the predictor constructs in partial regression to compute the VIF values (Hair et al., 2019; Hair Jr et al., 2017). A VIF value of 5 or more indicates that there is likely to be collinearity between constructs. Collinearity is also possible at values as low as 3 to 5 (Becker et al., 2015;

Hair et al., 2019; Mason & Perreault, 1991). Satisfactory VIF values are represented by values close to or less than 3: the lower the better (Hair et al., 2019).

4.7.6.2 Structural Model Path Coefficients

The second step of assessing the structural model is testing the significance of each hypothesised relationship among the latent variables (Hair et al., 2019). In PLS-SEM, path coefficient values are between approximately -1, representing negative path coefficients, and +1, representing positive path coefficients (Hair Jr et al., 2017). Values closer to zero represent insignificant relationships. SmartPLS 3 has a consistent PLS algorithm that outputs path coefficient values, and the significance of the path coefficients is determined by running PLS bootstrapping of 5000 or more samples. Bootstrapping computes the t statistics and the p values for all relationships of the structural paths. A t statistic of 1.96 or above concludes that the relationship is statistically significant. The p values also represent the significance of the path coefficients, where values equal to or less than .05 indicate statistical significance. Smaller p values show greater significance of the relationships.

4.7.6.3 Coefficient of determination (R^2)

The third step of structural model assessment is measuring the model's predictive power (Hair et al., 2019; Hair Jr et al., 2017). The R^2 values represent the combined effects of the exogenous constructs on the endogenous construct (Briones Peñalver et al., 2018). In other words, the effects of all constructs pointing to a construct are combined together to provide a value (R^2) that represents the amount of variance in that construct explained by the constructs determining it. To establish predictive capability for the dependent variables, the R^2 value for

each variable should be above .75, .50, or .25, which show significant, moderate, or weak variance, respectively (Hair et al., 2011; Henseler, Ringle, & Sinkovics, 2009).

4.7.6.4 Effect Size (f^2)

The fourth step is to assess f^2 , which refers to the change that occurs when a given exogenous variable is removed from the research model. The change in R^2 value may be used to identify whether the removed construct has a significant influence on the endogenous variables. Effect size values of 0.02, 0.15, and 0.35 reflect weak, moderate, and significant effects of the exogenous constructs, respectively (Cohen, 1988; Hair et al., 2019; Henseler, Ringle, & Sinkovics, 2009). Values less than 0.02 f^2 indicate no effect.

4.7.6.5 Predictive Relevance (Q^2)

The fifth step used to evaluate the PLS structural model is achieved by calculating the predictive relevance (Q^2) values (Hair et al., 2019; Hair Jr et al., 2017). The Q^2 values demonstrate the predictive relevance of the dependent variables (Geisser, 1974; Stone, 1974). PLS path models with predictive relevance are capable of accurately predicting data that are not used in the model estimation (Hair Jr et al., 2017). In SmartPLS, the Blindfolding procedure is used to automatically calculate Q^2 values. This procedure is only applied to endogenous constructs that are specified as having reflective indicators (Hair et al., 2011).

To show the model's predictive relevance, the Q^2 value should be above zero (Hair Jr et al., 2017; Henseler, Ringle, & Sinkovics, 2009). Values above zero indicate that the model holds predictive relevance or out-of-sample predictive power. Values of 0.25 indicate that the model depicts medium predictive relevance (Hair et al., 2019). Additionally, models with values higher than 0.5 are considered highly predictive models (Akter et al., 2011).

4.8 Model Fit

Model fit metrics provide researchers a means to detect misspecifications in the proposed model by measuring the extent to which a hypothesised model structure fits the empirical data (Hair Jr et al., 2017). The goodness-of-fit index (GoF) (Tenenhaus et al., 2005) is one method used to measure model fit; however, Henseler and Sarstedt (2013) argue that it is not a relevant measure of model fit for PLS-SEM. Hence, researchers are advised not to use GoF as a means of model evaluation in PLS-SEM (Hair Jr et al., 2017; Henseler & Sarstedt, 2013).

Alternatives to model fit methods include Henseler et al.'s (2014) use of the standardised root mean square residual (SRMR), a well-known CB-SEM model fit measure (Hair Jr et al., 2017). SRMR values less than 0.08 indicate a good fit model. A value of zero indicates a perfect fit model (Hair Jr et al., 2017). Another approach is to use the root mean square residual covariance (RMS_{theta}), which is similar to SRMR except that it relies on covariances (Hair Jr et al., 2017). RMS_{theta} values less than 0.12 indicate good fit, and higher values indicate lack of fit (Hair Jr et al., 2017; Henseler et al., 2014). However, some authors argue against the use of model fit measures in PLS-SEM for the reason that “their use can even be harmful as researchers may be tempted to sacrifice predictive power to achieve better ‘fit’” (Hair Jr et al., 2017). This is due to PLS analysis, which uses different methods that emphasise prediction over explanatory modelling (Hair Jr et al., 2017).

4.9 Summary

This chapter explained the research design used in the study. It also included an outline of the recruitment procedure and study participants. A detailed description of the measures adopted in the study was provided. This includes the scale measures and the questionnaire translation process. Additionally, the chapter examined the ethical implications of the study obtained from both SA and New Zealand. An introduction to PLS-SEM was presented, and a justification was provided for the use of PLS-SEM as the data analysis method, including details on common method bias, control variables, measurement model assessment, structural model assessment and model fit. Data analysis results will be revealed in the following chapter.

Chapter 5- Results

5.1 Overview

This chapter covers the empirical results and presents the data analysis results using PLS, as discussed in Chapter 4. Common method bias and control variables assessment results are presented in this chapter. Data were analysed in two phases: first, measurement model analysis, which included assessment of the internal consistency, convergent validity, and discriminant validity of the components measuring the latent variables; second, structural model analysis, which involved testing the model's predictive power (R^2), effect size (f^2), and predictive relevance (Q^2). This chapter also covers assessing the significance of each hypothesised relationship among the latent variables. Further, goodness of fit results are also discussed.

5.2 Descriptive Statistics

The questionnaire was administered through Qualtrics on social media platforms over a period of five weeks. Data collection started on August 6, 2021 and ended on September 16, 2021. A total of 225 complete responses were gathered. The collected data were assessed based on the inclusion and exclusion criteria. Only complete responses were recorded for this study. Incomplete responses were discarded automatically at the end of data collection, through Qualtrics. Three responses were also discarded because the respondents were underage, that is, less than 18 years old. Thus, 222 complete responses were used for data analysis. The 222 responses passed Qualtrics's quality checks, which include that none of the respondents sped through the survey and a good total completion rate. This sample size is considered adequate for the PLS-SEM analysis method (Hair et al., 2011, 2019; Lowry & Gaskin, 2014), where the minimum sample size is 10 times the number of total structural paths pointing at a specific construct in the model. Table 3 contains results of the demographic analysis.

The sample included 131 female participants, representing 59% of the sample, and 91 male participants, representing 41%. More than 56% of the participants were aged between 18 and 34 years, and 80% of the total respondents were below the age of 45 years. Saudi nationals represented the majority, 193 respondents representing 86.9%, compared with non-Saudi nationals, 29 respondents representing 13.1% of the total sample. In relation to highest level of education, bachelor's degree graduates ranked the highest with 132 participants representing 59.5% of the total sample. They were followed by postgraduates with 38 participants (17.1%), high school graduates with 32 participants (14.4%), then diploma graduates with 17 participants (7.7%). Lastly, 3 participants (1.4%) reported having below high school qualifications. The married group ranked the highest in the marital status demographics with a total of 128 participants (57.7%), followed by those who were single with 75 participants (33.8%), divorced with 12 participants (5.4%), then widowed and separated with 4 (1.8%) and 3

(1.4%) participants, respectively. More than 62% of the participants (139) reported earning less than 10,000 Saudi Riyals (SR) per month, followed by 44 participants earning between 10,000 and 15,000 SR (19.8%). Lastly, 39 participants (17.6%) reported earning more than 15,000 SR as their monthly income. The study sample included participants living in different regions within SA. More than 37% were from the Central Region; 26.6% were from the Western Region, 19.8% from the Southern Region, 11.3% from the Eastern Region, and 4.5% from the Northern Region. Of the 222 participants, 35.1% reported using TMH applications, and 64.9% reported not having used TMH applications prior to participating in this study.

Table 3

Demographic Analysis Results (n= 222)

Demographic variable	Group	Frequency	Percent (%)
Age	18–24	49	22.1%
	25–34	77	34.7%
	35–44	52	23.4%
	45–54	32	14.4%
	55–64	9	4.1%
	65 or above	3	1.4%
Gender	Male	91	41.0%
	Female	131	59.0%
Nationality	Saudi	193	86.9%
	Non-Saudi	29	13.1%
Education	Below high school	3	1.4%
	High school graduate	32	14.4%
	Diploma	17	7.7%
	Bachelor's graduate	132	59.5%
	Postgraduate	38	17.1%
Marital status	Single	75	33.8%
	Married	128	57.7%
	Divorced	12	5.4%
	Widowed	4	1.8%
	Separated	3	1.4%
Monthly income, Saudi Riyal (SR)	Less than 10,000 SR	139	62.6%
	10,000 to 15,000 SR	44	19.8%
	More than 15,000 SR	39	17.6%
Region	Northern	10	4.5%
	Central	84	37.8%
	Eastern	25	11.3%
	Western	59	26.6%
	Southern	44	19.8%
Used TMH applications	No	144	64.9%
	Yes	78	35.1%

Note: TMH, telemental health.

5.3 Common Method Bias

A full collinearity test based on VIF values, following Kock's (2015) procedure was performed on the data in SmartPLS, Version 3.3.9. A random variable (age) was employed as the dependent variable, which was regressed on all variables in the research model (PEU, PU, subjective norms, etc.). Results showed that the VIF values were below the 3.3 threshold, ranging from 1.034 to 2.775, indicating that common method bias is not a concern in the present study (Table 4).

Table 4

Common Method Bias Variance Inflation Factor Results

Variable	VIF Value
Age	
IU	1.133
PEU	2.775
PU	2.636
SN	1.034
Stigma	1.09
TCO	1.784
TCP	2.069
TT	1.762
TTMHA	2.267
TTech	2.458

Note: VIF, variance inflation factor; IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health applications; TTech, trust in the technology.

5.4 Control Variables

The data analysis process included controlled variables' assessment. We tested the model using demographic items as control variables (age, gender, nationality, education, marital status, income, region, and user type). The results showed that only user type (whether respondents have previously used TMH applications or not) was a significant control variable,

as shown in Table 5 (Note: for clarity, only user type results are shown). TMH application use had a significant negative relationship with intention to use and a significant positive relationship with the PEU. The results indicate that respondents who have previously used TMH applications have lower intentions to using the applications compared with non-users, and respondents who have used TMH applications have higher perceptions of the applications' ease of use.

Table 5

Results for User Type Control Variable for the Structural Model

Relationship	Path Coefficient	Std. Dev	<i>p</i> Value
User -> IU	-0.087	0.040	.031
User -> PEU	0.190	0.051	.000
User -> PU	-0.012	0.042	.773
User -> SN	0.038	0.069	.584
User -> Stigma	-0.116	0.063	.067
User -> TTMHA	-0.065	0.043	.131

Note: Only user type results are shown in the table for clarity. Std. Dev., standard deviation; IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TTMHA, trust in telemental health applications.

After introducing the control variable *user type* to the structural model, the variance *intention to use* increased from .714 to .720. The variance in PEU also increased from .469 to .503. Its effect size on intention to use and PEU was .026 and .074, respectively, showing weak effect. The structural model did not indicate any significant relationships with any other control variable. As such, the minor difference in variance for both intention to use and PEU is an indication that the control variables had weak influence on the structural model and that the theoretical constructs accounted for the majority of the variance in the structural model. Further, by introducing control variables, none of the hypothesised relationships between all the exogenous (trust in the care organisation, trust in the health care professional, trust in the

treatment, trust in the technology, subjective norms) or endogenous variables (trust in TMH applications, stigma, PU, PEU, intention to use) changed in direction or significance.

5.5 Measurement Model Assessment

The measurement model assessment focused on the evaluation of individual observed variables in relation to its latent variable, in terms of internal consistency, indicator reliability, validity, convergent validity, and discriminant validity. The research model was analysed using SmartPLS 3 (Ringle et al., 2015), a statistical software that uses PLS-SEM path modelling (Hair Jr et al., 2017), and reporting of our results followed the recommended guidelines (Hair et al., 2019; Hair Jr et al., 2017). The following sections discuss the findings of the measurement model analyses.

5.5.1 Indicator Reliability and Internal Consistency Reliability

As part of the measurement model evaluation, most observed variables showed high loadings, suggesting that half the variance in a construct is explained by its latent variable.

Three observed variables (TT4, TTMHA3 and TTMHA5) were removed from the analysis due to low outer loading values (<0.600), regardless of the CR and AVE values (Gefen & Straub, 2005). On the other hand, trust in the care organisation showed item TCO4 having a loading lower than but close to 0.708 (0.694); see Figures 4 and 5

Figure 4*Outer Loadings*

Matrix										
	IU	PEU	PU	SN	Stigma ^	TCO	TCP	TT	TTMHA	TTech
IU1	0.955									
IU2	0.958									
PEU1		0.895								
PEU2		0.911								
PEU3		0.920								
PEU4		0.874								
PEU5		0.894								
PEU6		0.905								
PU1			0.814							
PU2			0.846							
PU3			0.831							
PU4			0.910							
PU5			0.918							
PU6			0.852							
SN1				0.877						
SN2				0.938						
TCO1						0.744				
TCO2						0.793				
TCO3						0.815				
TCO4						0.694				
TCO5						0.834				

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TCO.

Figure 5*Outer Loadings, Continued.*

Matrix										
	IU	PEU	PU	SN	Stigma ^	TCO	TCP	TT	TTMHA	TTech
TCP1							0.840			
TCP2							0.859			
TCP3							0.830			
TCP4							0.759			
TT1								0.846		
TT2								0.908		
TT3								0.712		
TT4_R								0.436		
TT5								0.752		
TTMHA1									0.912	
TTMHA2									0.836	
TTMHA3_R									-0.314	
TTMHA4									0.878	
TTMHA5_R									-0.203	
TTech1										0.722
TTech2										0.909
TTech3										0.779
TTech4										0.820
TTech5										0.885
PSOSH1					0.739					
PSOSH3					0.804					
PSOSH5					0.808					
PSOSH4					0.839					
PSOSH2					0.865					

Note: TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health applications; TTech, trust in the technology; PSOSH, Perceptions of Stigmatization by Others for Seeking Psychological Help.

After assessing the CR for the trust in the care organisation construct, it held a value of 0.884 and an AVE value of 0.605. Hence, observed variable TCO4 was retained in the research model.

The measurement model is deemed to have satisfactory internal consistency only when each construct has a CR value of more than 0.7 and less than 0.95 (Hair et al., 2019; Hair Jr et al., 2017). Trust in TMH applications, a latent variable with two reverse-coded observed variables, showed a low CR value (> 0.7). This is an indication of lack of internal consistency reliability for this construct, providing additional support for removing the observed variables with extremely low loadings, resulting in an improved CR value for both constructs, trust in the treatment, and trust in TMH applications (Table 4).

During the measurement model analysis, we discovered that the CR value for PEU latent variable was more than 0.95. High CR value is problematic, as it implies item redundancy. PEU latent variable had a CR value of 0.953. Therefore, phraseology of the PEU's observed variables was reviewed for redundancy, which is considered a design flaw. The observed variables were highly correlated and phrased similarly, as expected because the items were reflective and measure the same phenomenon. All other indicators for their responding constructs mentioned above are representative of their latent variables. Hence, no design problems were identified. Table 6 shows the outer loadings, Cronbach's alpha, composite reliability values, and AVE for all observed variables.

Table 6*Outer Loadings, Construct Reliability, and Validity*

Items	Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
IU1	0.955	0.907	0.907	0.915
IU2	0.958			
PEU1	0.895	0.953	0.953	0.810
PEU2	0.911			
PEU3	0.920			
PEU4	0.874			
PEU5	0.894			
PEU6	0.905			
PU1	0.814	0.931	0.931	0.744
PU2	0.846			
PU3	0.831			
PU4	0.910			
PU5	0.918			
PU6	0.852			
SN1	0.876	0.792	0.903	0.824
SN2	0.939			
PSOSH1	0.740	0.870	0.906	0.659
PSOSH2	0.865			
PSOSH3	0.804			
PSOSH4	0.838			
PSOSH5	0.807			
TCO1	0.742	0.835	0.884	0.604
TCO2	0.793			
TCO3	0.814			
TCO4	0.698			
TCO5	0.834			
TCP1	0.839	0.841	0.893	0.677
TCP2	0.857			
TCP3	0.832			
TCP4	0.759			
TT1	0.838	0.838	0.89	0.671
TT2	0.903			

TT3	0.751			
TT5	0.776			
TTMHA1	0.917	0.853	0.911	0.773
TTMHA2	0.840			
TTMHA4	0.879			
TTech1	0.723	0.881	0.914	0.682
TTech2	0.908			
TTech3	0.778			
TTech4	0.820			
TTech5	0.885			

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; PSOSH, Perceptions of Stigmatization by Others for Seeking Psychological Help; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health applications; TTech, trust in the technology.

5.5.2 Convergent Validity

The AVE is used to assess the measurement model's convergent validity. As seen in Table 6, AVE values for all constructs vary from 0.604 to 0.915, which exceeds the suggested threshold value of 0.5. Thus, convergent validity was established within the measurement model.

5.5.3 Discriminant Validity

In the measurement model, this study uses three measures to assess discriminant validity: (1) cross loadings, (2) Fornell-Larcker criterion (Fornell & Larcker, 1981), and (3) the HTMT ratio (Henseler, Ringle, & Sarstedt, 2009).

The correlation between an observed variable and its corresponding latent variable should be greater than its correlation with other latent variables. The indicator loadings for the measurement model are presented in Table 7. As shown, the loadings for each observed

variable are greater than its cross-loadings, which means that the measurement model demonstrates discriminant validity.

Table 7*Cross-Loading Values*

Item	IU	PEU	PU	SN	Stigma	TCO	TCP	TT	TTMHA	TTech
IU1	0.955	0.619	0.698	0.131	-0.19	0.361	0.438	0.378	0.628	0.526
IU2	0.958	0.667	0.712	0.117	-0.189	0.368	0.402	0.398	0.645	0.57
PEU1	0.573	0.895	0.605	0.023	-0.268	0.325	0.322	0.274	0.509	0.578
PEU2	0.554	0.911	0.606	0.061	-0.291	0.332	0.337	0.306	0.537	0.602
PEU3	0.626	0.92	0.658	0.027	-0.303	0.421	0.426	0.382	0.58	0.668
PEU4	0.627	0.873	0.605	0.058	-0.219	0.4	0.389	0.35	0.584	0.612
PEU5	0.606	0.894	0.596	-0.019	-0.243	0.28	0.3	0.263	0.543	0.578
PEU6	0.64	0.905	0.606	-0.012	-0.276	0.352	0.364	0.293	0.532	0.583
PU1	0.541	0.509	0.814	0.123	-0.198	0.355	0.341	0.435	0.525	0.472
PU2	0.585	0.511	0.846	0.067	-0.255	0.372	0.436	0.494	0.587	0.524
PU3	0.582	0.508	0.831	0.057	-0.209	0.426	0.42	0.473	0.582	0.534
PU4	0.635	0.602	0.91	0.088	-0.208	0.376	0.392	0.474	0.579	0.558
PU5	0.736	0.654	0.918	0.069	-0.203	0.424	0.446	0.455	0.645	0.609
PU6	0.707	0.708	0.852	0.112	-0.238	0.429	0.457	0.422	0.61	0.618
SN1	0.112	0.019	0.053	0.876	0.075	0.12	-0.019	0.026	0.056	0.006
SN2	0.122	0.026	0.118	0.939	0.021	0.141	0.09	0.059	0.081	0.006

PSOSH1	-0.129	-0.205	-0.241	0.008	0.74	-0.16	-0.142	-0.114	-0.165	-0.187
PSOSH2	-0.137	-0.253	-0.21	0.026	0.865	-0.242	-0.236	-0.179	-0.208	-0.227
PSOSH3	-0.137	-0.157	-0.179	0.018	0.804	-0.177	-0.221	-0.208	-0.211	-0.173
PSOSH4	-0.155	-0.234	-0.176	0.016	0.838	-0.09	-0.104	-0.112	-0.188	-0.2
PSOSH5	-0.233	-0.333	-0.217	0.112	0.807	-0.177	-0.166	-0.074	-0.197	-0.25
TCO1	0.289	0.27	0.28	0.194	-0.148	0.742	0.427	0.37	0.355	0.32
TCO2	0.293	0.327	0.356	0.106	-0.252	0.793	0.553	0.462	0.423	0.45
TCO3	0.237	0.289	0.329	0.116	-0.161	0.814	0.451	0.373	0.38	0.346
TCO4	0.323	0.324	0.405	0.097	-0.052	0.698	0.434	0.373	0.421	0.419
TCO5	0.329	0.308	0.405	0.067	-0.198	0.834	0.587	0.534	0.464	0.457
TCP1	0.337	0.297	0.384	0.064	-0.148	0.553	0.839	0.525	0.481	0.398
TCP2	0.354	0.288	0.375	0.097	-0.163	0.565	0.857	0.519	0.46	0.453
TCP3	0.404	0.4	0.455	-0.029	-0.243	0.534	0.832	0.512	0.549	0.649
TCP4	0.343	0.311	0.367	0.043	-0.138	0.43	0.759	0.536	0.381	0.396
TT1	0.364	0.263	0.464	0.079	-0.181	0.445	0.568	0.838	0.443	0.409
TT2	0.395	0.307	0.494	0.065	-0.135	0.49	0.575	0.903	0.476	0.458
TT3	0.182	0.223	0.335	-0.008	-0.113	0.343	0.398	0.751	0.253	0.368
TT5	0.332	0.33	0.411	0.005	-0.111	0.492	0.493	0.776	0.421	0.478
TTMHA1	0.633	0.582	0.623	0.133	-0.221	0.512	0.529	0.46	0.917	0.706

TTMHA2	0.526	0.405	0.564	0.024	-0.139	0.398	0.45	0.452	0.84	0.582
TTMHA4	0.59	0.603	0.613	0.039	-0.262	0.48	0.535	0.421	0.879	0.631
TTech1	0.456	0.489	0.544	0.015	-0.14	0.523	0.436	0.457	0.547	0.723
TTech2	0.507	0.573	0.552	-0.03	-0.266	0.448	0.574	0.47	0.684	0.908
TTech3	0.41	0.4	0.448	-0.006	-0.167	0.329	0.443	0.402	0.549	0.778
TTech4	0.478	0.681	0.55	-0.001	-0.239	0.387	0.427	0.445	0.525	0.82
TTech5	0.513	0.628	0.57	0.047	-0.241	0.452	0.525	0.408	0.683	0.885

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health applications; TTech, trust in the technology; PSOSH, Perceptions of Stigmatization by Others for Seeking Psychological Help.

When assessing discriminant validity, according to the Fornell-Larcker criterion, the square root of the AVE of each latent variable should always be greater than its correlations with other latent variables (Fornell & Larcker, 1981; Hair Jr et al., 2017). This criterion has been fulfilled as evidenced by the measurement model results shown in Table 8.

Table 8

Fornell-Larcker Criterion

	IU	PEU	PU	SN	Stigma	TCO	TCP	TT	TTMHA	TTech
IU	0.956									
PEU	0.673	0.900								
PU	0.738	0.682	0.863							
SN	0.129	0.026	0.099	0.908						
Stigma	-0.198	-0.296	-0.253	0.048	0.812					
TCO	0.381	0.392	0.462	0.145	-0.210	0.777				
TCP	0.439	0.398	0.484	0.049	-0.215	0.637	0.823			
TT	0.406	0.347	0.53	0.050	-0.167	0.550	0.633	0.819		
TTMHA	0.666	0.609	0.684	0.077	-0.239	0.53	0.576	0.504	0.879	
TTech	0.573	0.672	0.645	0.007	-0.258	0.519	0.588	0.526	0.730	0.826

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health application; TTech, trust in the technology.

The HTMT, proposed by Henseler et al. (2009), is a replacement for the Fornell-Larcker method (Fornell & Larcker, 1981). An HTMT value of 1 or close to 1 indicates that the measurement model lacks discriminant validity. HTMT values must not exceed 0.90. As seen in Table 9, all HTMT values are less than 0.850, confirming that discriminant validity has been established in the measurement model.

Table 9

Heterotrait-monotrait ratio Values

	IU	PEU	PU	SN	Stigma	TCO	TCP	TT	TTMHA	TTech
IU										
PEU	0.722									
PU	0.796	0.716								
SN	0.152	0.043	0.110							
Stigma	0.219	0.32	0.281	0.072						
TCO	0.435	0.436	0.517	0.182	0.253					
TCP	0.501	0.438	0.54	0.092	0.245	0.749				
TT	0.445	0.381	0.59	0.072	0.196	0.638	0.742			
TTMHA	0.754	0.668	0.765	0.104	0.274	0.62	0.668	0.576		
TTech	0.641	0.733	0.71	0.031	0.289	0.599	0.665	0.612	0.834	

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health applications; TTech, trust in the technology.

Overall, the measurement model analysis concluded that the model has satisfactory reliability, convergent validity, and discriminant validity for the observed variables and their relationships to their respective constructs.

5.6 Structural Model Assessment

The structural model, also known as the inner model, is assessed to reflect the paths hypothesised in the research framework. This is tested by evaluating collinearity, predictive power, effect size, and predictive relevance.

5.6.1 Collinearity Assessment

Evaluating the collinearity within the structural model is the first step in the structural model assessment (Hair Jr et al., 2017). If there are high levels of collinearity (VIF values above 5) among the latent variables, the path coefficient values may be skewed (Hair Jr et al., 2017).

The collinearity must be assessed between each set of predicting constructs. Table 10 shows the collinearity values in the structural model. All VIF values show low levels of collinearity. As a result, it was concluded that none of the structural model constructs exhibited significant levels of collinearity with each other.

Table 10

Outer VIF Values

Variable	Collinearity VIF
IU	PEU-> IU
	2.330
	PU-> IU
	2.964
	1.027
PEU	SN-> IU
	1.128
	Stigma-> IU
	2.578
	TTMHA-> IU
PU	Stigma-> PEU
	1.081
	TTMHA-> PEU
	1.081
	PEU-> PU
Stigma	1.902
	SN-> PU
	1.018
	Stigma-> PU
	1.136
TTMHA	TTMHA-> PU
	1.853
	TTMHA-> Stigma
	1.000
	SN-> TTMHA
TTTech	1.056
	TCO-> TTMHA
	2.598
	TCP-> TTMHA
	3.436
TT	TT-> TTMHA
	2.402
	TTech-> TTMHA
	1.975

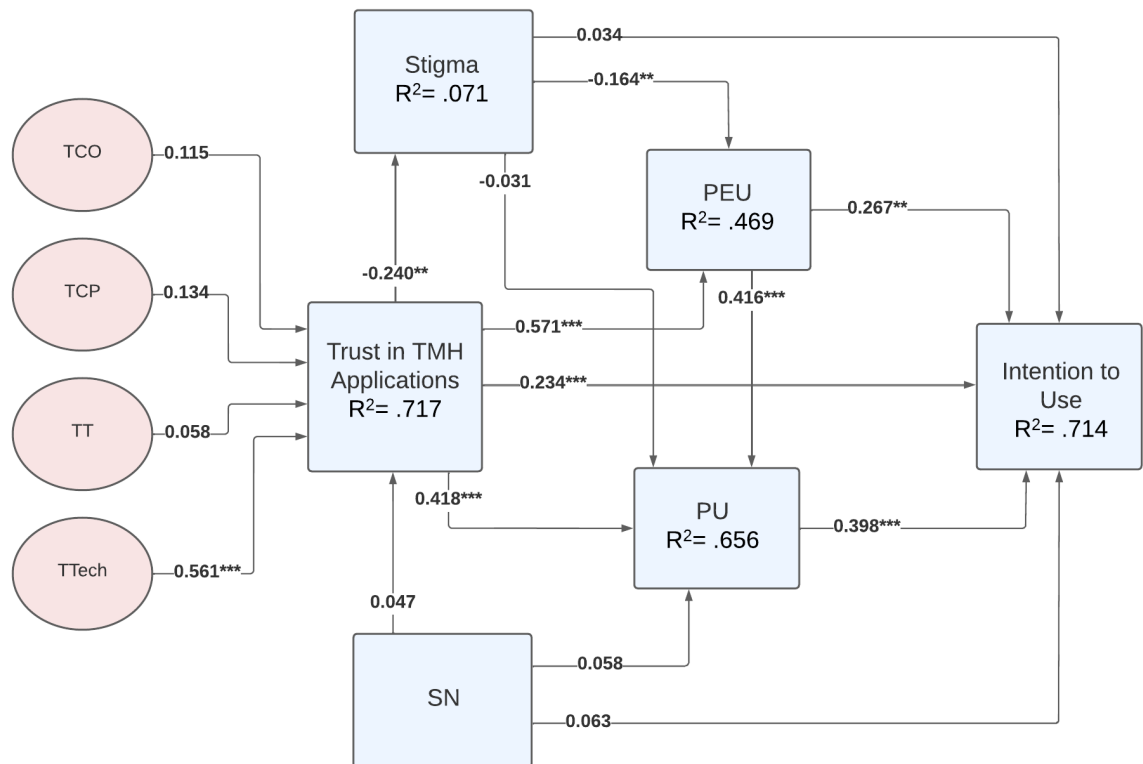
Note: VIF, variance inflation factor; IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TTMHA, trust in telemental health applications; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment;; TTech, trust in the technology.

5.6.2 Structural Model Path Coefficients

A PLS bootstrap of 5000 outputs was performed to evaluate the significance of the path coefficients and if correlations between constructs within the model support or reject the hypothesised relationships. The research model along with the results is presented in Figure 6.

Figure 6

Structural Research Model, Including Standardised Path Coefficients and R Squared Values



Note: TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTMHA, trust in telemental health application; TTech, trust in the technology; Stigma, perceived stigmatisation by others for seeking help; TMH, telemental health; SN, subjective norms; PEU, perceived ease of use; PU, perceived usefulness.

** Significant at $p < .05$. *** Significant at $p < .001$

The relationships are also assessed based on the relevance of relationship significance. This is used to report on the effect size of the significant relationships: some relationships may be significant but with small effect size. The total effect is the sum of direct and indirect effects between a one or more mediating constructs to another construct (Hair Jr et al., 2017). After assessing the total effects, it was established that all path coefficients were significant, with significant effect size. Table 11 shows results of the hypothesised relationships.

Table 11

Structural Model Path Coefficient Values

Hypothesised path	Path Coefficient	<i>t</i> Statistic	<i>p</i> Value	Result
H1a. Trust in the care organisation has a positive influence on trust in TMH applications.	0.115	1.582	0.114	Not supported
H1b. Trust in the care professional has a positive influence on trust in TMH applications.	0.134	1.749	0.080	Not supported
H1c. Trust in the treatment has a positive influence on trust in TMH applications.	0.058	0.852	0.395	Not supported
H1d. Trust in the technology has a positive influence on trust in TMH applications.	0.561	7.516	0.000	Supported
H2a. Trust in TMH applications has a negative influence on the perception of being stigmatised for seeking help.	-0.240	3.422	0.001	Supported
H2b. Trust in TMH applications has a positive influence on patients' perceived usefulness of TMH applications.	0.418	5.038	0.000	Supported
H2c. Trust in TMH applications has a positive influence on patients' perceived ease of use of TMH applications.	0.571	9.995	0.000	Supported
H2d. Trust in TMH applications has a positive influence on patients' intention to use TMH applications.	0.234	3.688	0.000	Supported

H3a. Perceived stigmatisation by others for seeking help has a negative influence on the perceived usefulness of TMH applications.	-0.031	0.735	0.462	Not supported
H3b. Perceived stigmatisation by others for seeking help has a negative influence on the perceived ease of use of TMH applications.	-0.164	2.595	0.009	Supported
H3c. Perceived stigmatisation by others for seeking help has a negative influence on the intention to use TMH applications.	0.034	0.789	0.430	Not supported
H4a. Subjective norms has a positive influence on patients' trust in TMH applications.	0.047	1.042	0.297	Not supported
H4b. Subjective norms has a positive influence on patients' perceived usefulness of TMH applications.	0.058	1.192	0.233	Not supported
H4c. Subjective norms has a positive influence on patients' intention to use TMH applications.	0.063	1.423	0.155	Not supported
H5a. Perceived ease of use has a positive influence on patients' perceived usefulness of TMH applications.	0.416	4.715	0.000	Supported
H5b. Perceived ease of use has a positive influence on patients' intention to use TMH applications.	0.267	2.846	0.004	Supported
H6. Perceived usefulness has a positive influence on patients' intention to use TMH applications.	0.398	4.181	0.000	Supported

Note: TMH, telemental health.

5.6.3 Coefficient of Determination (R^2 value)

To establish predictive capability for the dependent variables, the R^2 value for each variable should be above 0.1, and R^2 values of 0.75, 0.50, or 0.25 imply significant, moderate, or weak variance, respectively (Hair et al., 2011; Henseler, Ringle, & Sinkovics, 2009).

Structural model assessment results presented in Table 12, show that most R^2 values were above 0.1, indicating that the predictive capability was established. Dependent variables IU, PU, and trust in TMH applications showed moderate variance with the values 0.714, 0.656, and 0.717, respectively. The PEU construct held an R^2 value of 0.469, indicating weak variance, and stigma held an R^2 value of 0.071, which is insignificant.

Table 12

Summary of Measurement Model Assessment (R^2 and Q^2 Values)

Variable	Predictive Power (R^2)	Predictive Relevance (Q^2)
IU	0.714	0.557
PEU	0.469	0.315
PU	0.656	0.422
Stigma	0.071	0.036
TTMHA	0.717	0.429

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; Stigma, perceived stigmatisation by others for seeking help; TTMHA, trust in telemental health applications.

5.6.4 Effect Size(f^2)

According to Cohen (1988), effect size values of .02, .15, and .35 reflect weak, moderate, and significant effects of the exogenous constructs, respectively (Henseler, Ringle, & Sinkovics, 2009). Values less than .02 f^2 indicate no effect. A summary of the effect size assessment can be seen in Table 13.

Table 13*Structural Model Effect Size (f^2) Values*

Endogenous Variable	Exogenous Variable	f^2 value	Effect size
IU	PEU	0.099	Weak
	PU	0.208	Medium
	SN	0.018	No effect
	Stigma	0.006	No effect
	TTMHA	0.104	Weak
PEU	Stigma	0.043	Weak
	TTMHA	0.695	Significant
PU	PEU	0.225	Medium
	SN	0.009	No effect
	Stigma	0.001	No effect
	TTMHA	0.391	Significant
Stigma	TTMHA-> Stigma	0.081	Weak
TTMHA	SN	0.013	No effect
	TCO	0.014	No effect
	TCP	0.020	Weak
	TT	0.000	No effect
	TTech	0.843	Significant

Note: IU, intention to use; PEU, perceived ease of use; PU, perceived usefulness; SN, subjective norms; Stigma, perceived stigmatisation by others for seeking help; TTMHA, trust in telemental health applications; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTech, trust in the technology.

5.6.5 Predictive Relevance (Q^2)

All Q^2 values for all the exogenous variables were above zero. Intention to use had a value of 0.557; PEU, 0.315; PU, 0.422; stigma, 0.036; and trust in TMH applications, 0.429; as indicated in Table 12. The research model obtained a Q^2 value of 0.557, indicating that the model is highly predictive.

Confidence intervals were calculated by bootstrapping 5000 resamples. Significant relationships are shown by confidence intervals that vary from zero. Table 14 summarises the findings.

Table 14

Summary of Hypothesis Testing Results

	Path coefficient	Std. dev.	<i>t</i> Statistic	<i>p</i> Value	2.50%	97.50%
PEU -> IU	0.267	0.094	2.826	.005	0.103	0.470
PEU -> PU	0.416	0.088	4.732	.000	0.234	0.576
PU -> IU	0.398	0.096	4.163	.000	0.206	0.574
SN -> IU	0.063	0.043	1.460	.144	-0.023	0.142
SN -> PU	0.058	0.048	1.215	.225	-0.044	0.146
SN -> TTMHA	0.047	0.045	1.059	.290	-0.047	0.130
Stigma -> IU	0.034	0.044	0.766	.444	-0.052	0.119
Stigma -> PEU	-0.164	0.064	2.576	.010	-0.288	-0.037
Stigma -> PU	-0.031	0.042	0.733	.464	-0.111	0.057
TCO -> TTMHA	0.115	0.072	1.601	.109	-0.019	0.259
TCP -> TTMHA	0.134	0.076	1.768	.077	-0.019	0.280
TT -> TTMHA	0.058	0.067	0.861	.389	-0.074	0.193
TTMHA -> IU	0.234	0.065	3.626	.000	0.109	0.362
TTMHA -> PEU	0.571	0.057	9.946	.000	0.447	0.675
TTMHA -> PU	0.418	0.082	5.072	.000	0.256	0.579
TTMHA -> Stigma	-0.240	0.070	3.412	.001	-0.365	-0.095
TTech -> TTMHA	0.561	0.074	7.543	.000	0.412	0.697

Note: Std. dev., standard deviation; PEU, perceived ease of use; IU, intention to use; PU, perceived usefulness; SN, subjective norms; TTMHA, trust in telemental health applications; Stigma, perceived stigmatisation by others for seeking help; TCO, trust in the care organisation; TCP, trust in the care professional; TT, trust in the treatment; TTech, trust in the technology.

5.7 Model Fit

The SRMR, defined as the root mean squared ratio between observed and model-implied relationships, is used to assess model fit. A perfect model fit is indicated by an SRMR value of zero. This is due to SRMR being specified as an absolute measure of fit (Hair Jr et al., 2017; Henseler et al., 2014; Hu & Bentler, 1998). Model fit was assessed by the SRMR value, which

resulted in a value of 0.069, indicating acceptable model fit (value was below 0.080); see Table 15.

Table 15

Standard Root Mean Residual Values

	Original Sample (O)	Sample Mean (M)	95%	99%
Saturated Model	0.058	0.043	0.048	0.05
Estimated Model	0.076	0.052	0.063	0.069

Chapter 6- Discussion

6.1 Overview

The purpose of this chapter is to evaluate the study's results from Chapter 5 in response to the study hypotheses presented in Chapter 3. A discussion of significant findings relevant to the research field is presented. Further, this chapter provides a comprehensive assessment of the research findings in light of the existing literature, and on the basis of those results, conclusions are drawn. Lastly, the chapter concludes with an overview of the chapter contents.

6.2 Summary of Main Findings

The present study sought to identify and verify factors influencing the acceptance and adoption of TMH applications in SA. The study employed a questionnaire to collect data, and data were analysed using the PLS-SEM method. Based on the research findings, people's trust in the technology emerged as the single most significant dimension of trust. It was shown to have positive influence on people's overall trust in TMH applications. Further, there was positive correlation between trust in TMH applications and the PEU, PU, and intention to use the applications. Moreover, people's perceptions of being stigmatised by those closest to them was found to be negatively influenced by the overall trust in TMH applications, meaning that higher levels of trust result in lower perceptions of stigma. The study findings showed that stigma negatively influenced people's PEU and had no influence on the PU or the intention to use TMH applications. In the current research model, subjective norms did not demonstrate significant effects. The study also found that the PEU positively influenced PU and intention to use TMH applications. In addition, PU demonstrated positive and significant influence on people's intentions to use TMH applications.

6.3 Discussion of the Survey Findings

Research question1: Does trust in TMH applications influence an individual's acceptance of and intentions towards using TMH applications?

With respect to the first question, given the multidimensions of trust measured, research findings make it possible to begin to understand the core domain factor which contributes to people's overall trust in TMH applications in SA. Indeed, technological trust was positioned positively and significantly correlated with overall trust ($\beta = 0.561$, $p = .000$). This finding is

in line with previous research by van Velsen et al. (2021) and Yang et al. (2021) who established technological trust as an antecedent of overall trust in online health services.

The study findings reveal that, for Saudi Arabian adults, the multidimensions of trust, trust in the care organisation, trust in the care professional, and trust in the treatment have no significant influence on the overall trust in TMH applications. These findings are inconsistent with previous studies, including Yang et al. (2021), van Velsen et al. (2017), and Zheng et al. (2017) who found hospital trust (i.e., trust in the care organisation), interpersonal trust (i.e., trust in the care professional), and treatment trust to be subdimensions and building blocks of people's trust in online health services. Furthermore, in their more recent study, van Velsen et al. (2021) revised their initial proposition of the multidimensions of trust to include trust in technology as the only subdimension that directly influences overall trust. Other subdimensions of trust demonstrated no direct influence on overall trust, and, instead, interacted and influenced each other. In their study, for instance, trust in the care professional influenced the trust in the treatment. Hence, with respect to trust in the technology, the present study findings are in line with those of van Velsen et al.'s study.

Further, it is possible that trust in the care organisation, trust in the care professional, and trust in the treatment are not significant elements in shaping people's overall trust in TMH applications prior to adoption. These dimensions of trust, however, may be more relevant during the use of the services. Previous research assessed the influence of these three dimensions of trust and how it influences overall trust within current service users, for example, van Velsen et al. (2017), who looked at patients who used telemedicine services, and Yang et al. (2021), who examined multidimensional trust and its influence on experienced users of an online medical consultation service. Their findings suggest that trust is multidimensional and that these dimensions impact users' overall trust in health care technology. However, in our study, the majority of participants indicated that they had not used TMH applications prior to

participating in the study, and their initial thoughts were that trust in the care organisation, trust in the care professional, and trust in the treatment do not have a significant effect on their overall trust in TMH applications.

A noteworthy finding of the current study was the negative correlation between people's overall trust in TMH applications and their perceptions of being stigmatised for seeking help ($\beta = -0.240$, $p = .001$), meaning that greater levels of trust were associated with lower perceptions of stigma. As of date, this finding has not been reported or investigated empirically in the literature, although there is research indicating that high levels of stigma result in lower levels of trust (Verhaeghe & Bracke, 2011). This study found no significant influence of perceived stigma on overall trust, suggesting that trust in TMH applications may play a role in minimising people's perceived stigma, which could result in higher acceptance of the applications.

The present study was also designed to assess the influence of trust in TMH applications on the PEU, PU, and intention to use. The study findings demonstrated that the overall trust in TMH applications positively and directly influences people's PEU ($\beta = 0.571$, $p = .000$), PU ($\beta = 0.418$, $p = .000$), and intentions toward using the applications ($\beta = 0.234$, $p = .000$); meaning that establishing higher levels of trust can result in greater and more positive perceptions of TMH applications' ease of use and usefulness in addition to higher intentions toward using them to seek mental health care.

These findings mirror those of previous studies that have examined the effect of trust on technology acceptance and the use of health care technology. For instance, Ortega Egea and Roman Gonzalez (2008) extended the TAM to incorporate trust in the context of electronic health care records and found trust to exhibit direct influence on the PEU and PU. According to their study, however, there is no direct correlation between trust and intention to use. In

another study by Tung et al. (2008) looking at TAM and trust in electronic logistics information systems, trust was found to positively influence the PU and intention to use. They also presented evidence that the PEU exerts influence on trust. This is opposite to our study, where we hypothesised that trust would exert influence on the PEU, and our findings support our hypothesis.

In SA, studies have shown that the general Saudi population have high levels of trust in health care professionals (Alduraywish et al., 2020). On the other hand, lack of trust has been identified as a major barrier to the use of telemedicine services (Alshammari & Hassan, 2019). The lack of trust in telemedicine could be caused by the lack of personal and physical interactions with the health care professionals (Alshammari & Hassan, 2019). This highlights the cultural value placed on patient-doctor relationship and its influence on building trust and rapport. The findings in the current study showed that trust in the technology, through which the mental health service is provided, is the main contributor to overall trust in TMH applications.

Overall, these findings provide some support to the conceptual proposition that trust influences acceptance of and intention to adopt TMH applications. Furthermore, these results provide valuable insights on the significance of trust in the technology and the extent to which people rely on it for their overall trust in TMH applications.

Research question 2: Does the perception of social stigma influence individuals' acceptance of and intentions to use TMH applications?

In reviewing the literature, no prior research was found on the association between perceived stigma and the acceptance of TMH applications in SA. Hence, the second question in this study looked at the relationship between perceived stigma associated with mental health, in relation

to individuals' close social networks, and factors believed to affect acceptance of and intention to utilize TMH applications. This study found that perceived stigma failed to demonstrate significant association with PU and intention to use, but it pointed toward the expected direction where it negatively influenced the PEU. This means that high levels of stigma result in TMH applications being perceived as difficult to use.

This observed correlation can be partially explained by existing studies that suggest that stigma leads to low self-efficacy (Corrigan & Rao, 2012); this includes self-efficacy with technology. In other words, the perceived stigma can hinder acceptance of TMH applications. This may be due to stigma resulting in people having internalised negative perceptions towards themselves, their illness, and the treatment. For example, when depression is present, people experience low energy and impaired concentration and require more effort to perform the same tasks. These factors, combined with high perceptions of stigma, can lead people to perceive TMH applications as difficult to use.

These findings are contrary to those of Lamela et al. (2020) who examined the influence of personal stigma on the acceptance of and intention to use psychological interventions delivered over the internet to treat depression. They found that stigma does not correlate with effort expectancy (i.e., PEU) and that higher levels of stigma were directly associated with lower PU and lower intentions to use. Further, existing studies also suggested that stigma surrounding mental illness is associated with lower acceptance of and, as a result, less intentions to seek help, be it through traditional methods (Abolfotouh et al., 2019; Clement et al., 2015), or internet-based methods (Levin et al., 2018).

Although prior studies reported perceived stigma as a barrier to seeking mental health care, our findings suggest that there is no direct association between stigma and PU or intention to use TMH applications. Perhaps the explanation for this discrepancy lies in some of the benefits

provided by TMH applications. Easy and quick access to mental health care, anonymity, and privacy (Hubley et al., 2016; Langarizadeh et al., 2017) may present TMH applications as a less intimidating alternative to seeking mental health care. In addition, it provides people with the opportunity to avoid being seen publicly attending a therapy clinic.

In a study by Levin et al. (2018), who assessed the influence of stigma on the use of self-help tools, it was found that students with higher levels of self stigma were more likely to seek help through self-help tools, which includes TMH applications. In light of this, we cannot include that perceived stigma has a role to play in people's decision to seek help via TMH applications as it does on their decision to seek help through more conventional methods.

This study focused on the general Saudi adult population and did not include questions about the research participants' mental health experiences. Therefore, it is safe to assume that not all participants in the study have been affected by mental illness. As a result, participant responses may not represent the perspective of those who feel stigmatised for seeking help due to their mental illness. These results therefore need to be interpreted with caution.

Recent research shows that of those who seek mental health treatment, 42% terminate treatment after their second visit, and this research indicates that stigma is a contributing factor to the high dropout rates in SA (Alangari et al., 2020, 2022). While stigma did not influence participants' intentions to use TMH applications in the current study, stigma is widely accepted in the literature to hinder seeking out help when it comes to mental health. These results therefore need to be interpreted with caution, and further research should explore this phenomenon in the context of TMH applications.

Research question 3: Does subjective norms influence individuals' acceptance of and intentions to use TMH applications?

This study set out with the aim of assessing the influence of subjective norms amongst SA adults regarding the acceptance and adoption of TMH applications. Contrary to expectations, the study did not find significant correlation between subjective norms and trust, PU, PEU, or intention to use. This differs from the findings presented in studies focusing on SA, such as Bamufleh et al. (2021), who reported social influence (i.e., subjective norms) as having positive influence on intention to using e-health mobile applications, and Albar and Hoque (2019), who looked at patient acceptance of e-health services in SA. In addition, this finding differs from findings of Kamal et al.'s (2020) research, which examined acceptance of telemedicine services within cultural dynamics similar to those in SA.

TMH applications in SA are relatively new (Banjar & Alfaleh, 2021) and their use is low in the country, which could explain these results. Another explanation may be the lack of awareness/knowledge about TMH applications and mental health (AlHadi et al., 2021; Qureshi et al., 2021). In addition, the majority of the research sample (64.9%) indicated that they had never used TMH applications, which may be indicative of a lack of familiarity with the applications; therefore, participants found that those most important to them and those who influence their decisions neither recommended nor opposed their use. Further, finding no effect to subjective norms on people's acceptance of and intention toward using TMH applications may imply people's ability to develop independent assessments and perceptions of TMH applications, placing less emphasis on the opinions of others. In sum, preliminary research findings indicate that subjective norms is not a significant factor in influencing the acceptance of and intention to use TMH applications in SA.

Research question 4: Do perceived ease of use and usefulness influence individuals' intentions to use TMH applications?

Prior studies have highlighted the importance of the PEU and PU in medical technology acceptance and adoption. However, in mental health technology, there are contradictory findings concerning the relevance of both TAM variables. On the question of the influence of PEU, the current study found that PEU significantly and positively influences the PU ($\beta = 0.416, p = .000$), confirming the findings of previous studies (AlBar & Hoque, 2019; D. Becker, 2016; Monthuy-Blanc et al., 2013). Consequently, people who perceive TMH applications as easy to use are likely to also perceive them as useful.

The results of this study provide support for the proposition that PEU positively influences intention to use TMH applications ($\beta = 0.267, p = .000$), which is in line with the findings of Molfenter et al. (2021) but contradicts those of Becker (2016) and Monthuy-Blanc et al. (2013). The results show that high perceptions of TMH applications' ease of use are associated with higher desire to use the applications to seek professional psychological help.

The research findings demonstrate that PU is a strong predictor of intention to use TMH applications in SA ($\beta = 0.398, p = .000$). These results are consistent with previous studies investigating the applicability of TAM in health care technology acceptance and adoption. For instance, Bamufleh et al. (2021) and Yamin and Alyoubi (2020) identified the PEU and PU as drivers that contribute to the acceptance and adoption of telemedicine applications in SA. These findings also coincide with Kamal et al.'s (2020) and Tung et al.'s (2008) research conclusions.

Trust in TMH applications, PEU and PU are, therefore, important factors that influence people's acceptance of and intentions to use TMH applications in SA to seek professional mental health care. Availability of factors such as mobile devices with reliable internet connections, applications with a user-friendly interface and design, and easy application navigation are indications of PEU, which may facilitate greater acceptance of and intention towards using TMH applications. Further, if people perceive TMH applications as effective

and convenient and that they provide easy access to care and anonymity, this is likely an indication of positive PU and, as a result, can positively influence people's intentions toward using the applications.

6.4 Implications

6.4.1 Implications for Theory

This study contributes to the literature by identifying elements that influence TMH applications' acceptance and use intentions. The study shows that people's trust in TMH applications prior to using it is not influenced by their trust in the care organisation, the care professional, or the treatment. More importantly, the study presents evidence that technological trust is the primary driver of people's overall trust in TMH applications. This is represented by their privacy, security, safety, and ease of use. Additionally, the study contributes to the literature by emphasising the importance of trust in minimising perceptions of stigma when seeking psychological help. Trust may be used to bridge between perceived stigma and seeking help through TMH applications. In essence, the results suggest that people with higher levels of trust in TMH applications are less likely to think that others within their social network would stigmatise them if they sought psychological help.

Moreover, the empirical findings in this study provide a new insight into the extent to which perceived stigma influences acceptance of and intention to use TMH applications. Although this study shows a significant and negative influence of perceived stigma on PEU, the results also showed that perceived stigma does not influence people's intention to use TMH applications. This insight points out that although perceived stigma associated with mental illness does have an adverse effect on people's PEU of TMH applications, it does not directly interfere with people's intentions towards adopting TMH applications.

The present study is the only empirical investigation into the impact of subjective norms on people's acceptance of and intention to use TMH applications in SA, and despite its exploratory nature, an insight it offers is the insignificant influence of subjective norms on acceptance of and intention to use TMH applications. These important findings oppose what is reported in

the literature. Although these findings may be explained by lack of awareness about TMH applications, further research is needed to examine the association between subjective norms and technology acceptance and adoption more closely.

This study presents empirical evidence of the applicability of the TAM in the context of TMH applications in SA. It supports previous studies stressing the importance of integrating trust with the TAM when investigating acceptance of health care technology. Our study reveals that trust influences people's perceptions of TMH applications' ease of use and usefulness. Trust is also shown to directly influence intention to use.

6.4.2 Implications for Practice

Although this study mainly intended to test an underlying theoretical model to identify factors that influence people's acceptance of and intention toward using TMH applications, its findings have several implications to promote people's acceptance of TMH applications in SA.

The study found that trust in technology predicts the overall trust in TMH applications, and that overall trust predicts the PEU, PU, and intention to use the applications. Trust, PEU, and PU can be considered strategic elements for TMH applications' acceptance and adoption. Therefore, the findings encourage that these elements be considered during future developments and design of TMH applications.

People in SA have previously indicated that they would like to use mobile applications to manage their mental health (Atallah et al., 2018). However, adoption of TMH applications is low and slow. Furthermore, there are many mental health applications available in the application stores offering a wide range of services including meditation, coaching, and social support.

Furthermore, it is necessary that mental health agencies and service providers educate the Saudi public on the benefits TMH applications offer. To promote trust, providers can shed light on benefits such as privacy, security, confidentiality, and laws and regulations. To promote usefulness, providers can focus on the applications' effectiveness, usability, accessibility, and availability.

With respect to perceived stigma, more education and awareness about mental health and the benefits of TMH applications need to be spread among the Saudi population to break down the negative internalised feelings of shame and inferiority. People must become aware of the effect of perceived stigma on their internalised perceptions and thoughts.

Focusing on the ease of use of TMH applications is important to their adoption. Our study found that perceived stigma negatively influences people's perceptions of the applications' ease of use. This may indicate to providers to further simplify applications that aim to provide mental health care. This can be achieved by focusing on multiple aspects of the applications such as user interface, colour, personalisation, and intuitive navigation.

6.5 Summary

This chapter presented the main research findings and answered the research questions with respect to prior studies. The chapter discussed the influence of trust, perceived stigma, PEU, and PU on the adoption of TMH applications in SA. Possible explanations for the results were presented. The chapter also drew out the theoretical and practical implications of the study. The next chapter will present a summary of the study, research limitations, and future research recommendations.

Chapter 7- Conclusion

7.1 Overview

This chapter presents an overview of the study. It summarises the research objectives, methodology, and results. Based on the study findings, the four research questions are addressed in this chapter. Further, possible future directions and research limitations are presented, and finally, concluding remarks.

7.2 Research Summary

The purpose of this study was to assess and identify factors that influence acceptance of and intention towards using TMH applications among Saudi Arabian adults. A cross-sectional design was used, and a questionnaire was distributed online to collect data. Recent research reveals that the number of Saudis experiencing mental illness has increased because of circumstances including the COVID-19 pandemic. The literature also reports that mental illness is likely to go unreported despite its effects on health (Bharadwaj et al., 2017). Elements contributing to this can be lack of awareness about mental health (AlHadi et al., 2021) and sociocultural beliefs (Al Mousa et al., 2021). Several initiatives have been formulated by the Saudi Arabian government to increase access to mental health care (Alhodaib & Alanzi, 2021), one of which is through implementing TMH applications.

The literature reports that TMH is as effective as in-person clinic visits. Furthermore, the use of TMH applications offers benefits including quick access to mental health care, lower costs, and anonymity (Hubley et al., 2016; Langarizadeh et al., 2017). Despite this, adoption of TMH applications is low and slow (Cowan et al., 2019; Ganapathy et al., 2021). This was a motivation for the current study: to attempt to uncover reasons for people's hesitation/non-use of TMH applications, focusing on Saudi adults, using a theoretical framework. The study was also motivated by the lack of empirical research on trust, perceived social stigma, subjective norms, acceptance, and adoption of online mental health services.

The first chapter of this thesis provided the research importance and motivation. This included an overview of TMH and its benefits according to the literature. It also discussed the barriers to the adoption of TMH applications. Barriers to the use of TMH applications in SA include lack of trust, perceived social stigma, and cultural norms, beliefs, and customs. This chapter touched briefly on the effects of the COVID-19 pandemic on people's mental well-being. Next, the chapter discussed the findings of prior research, which concluded that

surveyed people in SA express interest in the use of mental health applications; however, the majority have never used the applications. This finding calls for further research to investigate possible elements which may influence people's acceptance of and intention towards using TMH applications, using well-established theories. Theoretical frameworks and research grounds were then introduced and briefly discussed. This involved the TAM, TRA, multidimensional trust, and perceived social stigma. Next, the research objectives and questions were presented, and, finally, a brief discussion of the research contributions and implications.

The second chapter presented a comprehensive review of the available literature. Here, mental health was introduced, and the current state of mental health in SA was evaluated. This included further elaborations on the effect of sociocultural beliefs and subjective norms on the acceptance of mental illness and traditional methods used to cope with and treat mental illness. Next, the chapter pointed to the lack of empirical research on TMH applications in SA, highlighting the few studies published, which focused on establishing frameworks and guidelines for TMH implementation in the country. Following this, the chapter presented the literature on multidimensional trust, stigma associated with mental illness, subjective norms, and the TAM variables (PEU and PU) with respect to medical technology acceptance. Literature gaps were highlighted as well as the need for a thorough investigation of factors that may influence acceptance and adoption of TMH applications.

Chapter 3 provided definitions of the research variables and discussed the development of the research model. The variables are trust in the care organisation, trust in the care professional, trust in the treatment, trust in the technology, overall trust in TMH applications, perceived stigma, subjective norms, PEU, PU, and intention to use TMH applications. A total of 17 hypotheses were proposed with supporting theoretical evidence.

In Chapter 4, the research methodology was described. Data were collected using an anonymous online questionnaire. The survey link was shared via social media (Twitter, Facebook, and WhatsApp), emailed to personal and professional networks, and emailed to TMH applications' providers. This study targeted the general Saudi population. The chapter introduced the measures used to design the questionnaire and the translation procedure. Finally, the chapter detailed the data analysis methods and reasons for selecting PLS-SEM. Data analyses including common method bias, testing for control variables, measurement model assessment, and structural model assessment were detailed in this chapter.

Chapter 5 revealed the results of the data analysis. According to the methodology described in Chapter 4, the measurement model reliabilities and validities were discussed. The structural model assessment results were also detailed in this chapter. Nine hypotheses were supported (H1d, H2a, H2b, H2c, H2d, H3b, H5a, H5b, H6) and eight were rejected (H1a, H1b, H1c, H3a, H3c, H4a, H4b, H4c).

Chapter 6 summarised the research findings. The research results were discussed with reference to the research questions in light of the available literature. Consistent and inconsistent findings were highlighted, and possible explanations were discussed. Finally, the chapter identified research implications for theory and practice.

Research question1: Does trust in TMH applications influence an individual's acceptance of and intentions towards using TMH applications?

The results of this study show that among the trust dimensions (trust in the care organisation, trust in the care professional, trust in the treatment, trust in the technology) only trust in the technology showed a significant and positive influence on people's overall trust in TMH applications. Further, overall trust in TMH applications showed significant and positive

influence on the PEU, PU, and intention to use TMH applications. The research found trust to be the strongest predictor of the PEU and PU. Lastly, the study found that high levels of trust are associated with lower perceptions of social stigmatisation. In sum, trust in TMH applications showed positive and significant influence on people's acceptance of and intention towards the use of TMH applications.

Research question 2: Does the perception of social stigma influence individuals' acceptance of and intentions to use TMH applications?

The research found that perceived stigma had significant negative influence on PEU of TMH applications. The perceived stigma, however, did not show influence on the PU, or the intention to use TMH applications. Accordingly, perceived stigma may have less of an impact on intention to seek mental health care than the literature suggests.

Research question 3: Does subjective norms influence individuals' acceptance of and intentions to use TMH applications?

In this study, it was found that subjective norms had no impact on people's acceptance of and intentions to use TMH applications. This is contrary to what is reported in SA with respect to medical technology acceptance and adoption.

Research question 4: Do perceived usefulness and perceived ease of use influence individuals' intentions to use TMH applications?

The results of this study found that the PEU and PU positively and significantly influence people's intentions to use TMH applications. The results found PU to be the strongest predictor of intention to use TMH applications to seek professional psychological help.

7.3 Future Research Directions

Looking on to the future, further investigations into TMH applications' acceptance and adoption is recommended, with a focus on mental health patients. Qualitative research method can for instance, provide a more comprehensive understanding of the influence of multidimensional trust on patients' acceptance of and intentions to adopt TMH applications.

Furthermore, intentions to use are not always indicative of actual use of TMH applications or usage continuity. As people become more familiar with TMH applications, their perceptions may change. For instance, our findings indicate that trust in the care professional and trust in the treatment are not correlated with overall trust in TMH applications. It is possible that these perceptions may change once people use the applications, and people may perceive trust in the care professional and trust in the treatment as necessary elements of usage continuance. Hence, future research can employ a longitudinal research approach.

Future research should also focus on investigating the effectiveness of therapeutic and clinical interventions when delivered via TMH applications in SA. Moreover, although international research has found TMH to be comparable to face-to-face methods, future studies can take a comparative approach in which acceptance, or effectiveness, is compared between traditional and technological methods of delivering psychological interventions within the Saudi Arabian context.

The finding related to the effect of perceived stigma on people's perceptions of TMH applications' ease of use can be used as a focus point for future research to discover ways in

which technological aspects of mental health care can be simplified and made easy to use. Alternatively, future research can be aimed at developing strategies and educational approaches to minimise people's perceptions of being stigmatised for seeking psychological help.

To develop a more comprehensive understanding of the effect of perceived stigma on the intention to use TMH applications, additional research will need to test this hypothesis among those living mental illness.

7.4 Limitations

This study attempted to shed light on important factors that influence people's acceptance of and intention towards using TMH applications for seeking mental health care in SA. As a limitation of the research design, the study may have missed some critical factors relevant to mental health and the Saudi Arabian context such as illness severity, preference (i.e., preferring to seek help via different avenues, for instance, a faith healer), attitude towards seeking psychological help through TMH applications, and ability (i.e., is the person's ability to seek help through a TMH application).

The participant recruitment procedure did not give the target respondents equal opportunity to participate in the study. It restricted the survey availability to only those who have access to the internet, have social media accounts, and have received the survey link. Hence, selection bias may have been present in this study causing the findings to lack generalisability.

The COVID-19 pandemic, travel constraints, and time constraints made it difficult to carry out the study in the way it was intended. Therefore, these circumstances shifted the focus of the research from mental health patients who have used TMH applications in SA to include the general adult Saudi public. Hence, it can be argued that the PATAT may not be entirely appropriate for use within the collected data sample because it was intended for users of the

services. Nonetheless, the instrument was able to capture the self-reported perceptions of participants (users and non-users). Hence, the findings should be interpreted with cautiously. Furthermore, another limitation of the study is the use of self-reported measures, which may have introduced response bias from the surveyed population.

7.5 Concluding Remarks

In conclusion, TMH applications can alleviate the pressure on the health care systems. They are an effective approach to diagnosing, assessing, and treating mental illness, although more research is required. TMH applications offer easy and quick access to mental health care by certified physicians. However, slow adoption and low engagement with the applications have been reported to undermine their effectiveness. Existing research that have discussed barriers and challenges in implementing TMH applications in SA have largely been descriptive and lacking theory. Drawing heavily on the TAM, TRA, and the literature on multidimensional trust, and perceived social stigma, this study investigated factors that contributed to the acceptance and adoption of TMH applications in SA.

The findings of this study provide valuable information about factors that may deter or facilitate acceptance and adoption of TMH applications in SA. This study found that people consider trust in the technology as the most important subdimension of trust in TMH applications. Trust in the technology pertains to privacy, security, anonymity, and legal policy of the applications. Further, trust, PEU, and PU were identified as antecedents of people's intentions to use TMH applications. The current study revealed that despite the perceived stigma's negative influence on the PEU, people did not find it to negatively influence their intention to adopt TMH applications. Similarly, subjective norms showed no influence in this study.

The literature review combined with the study's findings indicates a need to inform the Saudi public about the availability, accessibility, usability, security, and privacy of TMH applications. In addition, greater efforts are needed to increase awareness about mental health, symptoms, and treatments available in the country.

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Appendix A: Ethics Approvals

(A1) Ethics approval from Saudi Ethics Committee



Saudi Arabia Kingdom
Ministry of Education
Taif University
Research Ethics Committee



لجنة أخلاقيات البحث العلمي

COMMITTEE DECISION

Dear Dr. Hussain Alyami

Application No.: 42-177

The ethics committee at Taif University recently reviewed your request to obtain the committee's approval of the research proposal shown below. The committee is accredited by the National Committee for Bioethics with No. (HAO-02-T-105) and the committee considered that the proposal fulfils the requirements of Taif University and accordingly ethical approval was granted (from JUNE 2021 to JUNE 2022). Any changes to these approved conditions have to be reported to the committee.

Proposal Title:

Patients' perceptions and experiences of Telemental Health Applications in Saudi Arabia. A study of Trust and Subjective Norms.

Proposal status

- ☒ Approved
- ☐ Approved after amendments (please see enclosed file)
- ☐ Not approved (please see enclosed file)

Kind regards,
Dr. KHALED ALSWAT



Mohammed

لجنة أخلاقيات البحث العلمي

سعادة الباحث / د. حسين اليامي

رقم البحث / 42-177

قامت لجنة الأخلاقيات بجامعة الطائف مؤخراً بمراجعة الطلب المقدم من قبلكم الخاص بالحصول على موافقة اللجنة على المقترح البحثي الموضح أدناه. علماً بأن اللجنة معتمدة من اللجنة الوطنية للأخلاقيات الحيوية برقم (HAO-02-T-105) ورأت اللجنة أن المقترح مستوفياً لمتطلبات جامعة الطائف وعليه تم منح الموافقة الأخلاقية من تاريخ (يونيو ٢٠٢١ الى يونيو ٢٠٢٢).

عنوان المشروع البحثي :

تقييم استخدام المرضى لتطبيقات الصحة النفسية عن بعد في المملكة العربية السعودية. دراسة الثقة التقنية والمعايير الذاتية
القرار :

☒

موافق عليه

☐

يوافق عليه بعد إجراء التعديلات المرفقة

☐

غير موافق عليه مع الاطلاع على الأسباب المرفقة

رئيس اللجنة

د / خالد بن عبدالله السواط

التاريخ 17-11-1442



Mohammed

وكالة الجامعة للدراسات العليا والبحث العلمي
لجنة أخلاقيات البحث العلمي بجامعة الطائف
Scientific Research Ethics Committee

استمارة الموافقة علي المشاركة في البحث

- (١) أنت مدعو/مدعوة من قبل (حسين اليامي) إلى المشاركة في بحث علمي،
- (٢) تحت عنوان: (تقييم استخدام المرضى لتطبيقات الصحة النفسية عن بعد في المملكة العربية السعودية. دراسة الثقة التقنية والمعايير الذاتية)
- (٣) الذي يجري (اونلاين)
- (٤) الغرض من الدراسة: دراسة استخدام وانطباع مستخدمي تطبيقات الصحة النفسية عن بعد في المملكة العربية السعودية. قياس مستوى بصمة العار التي تصحب من يعاني من مشاكل نفسية عندما يبحث عن المساعدة.
- (٥) الإجراءات / الأعمال المطلوبة من المشارك/ توضيح نوع العينات التي ستؤخذ من المشارك خلال فترة البحث وكميتها، وكيفية استخدامها (إن وجدت): بعد الحصول على الموافقة الالكترونية، يقوم المشاركون بتعبئة الاستبيان والاجابة على الأسئلة. يوجد أسئلة تتعلق بما يتصوره المشترك عن وصمة العار من قبل الآخرين بمن يعاني من مرض نفسي و يطلب المساعدة. أيضا، أسئلة عن المعايير الشخصية لاستخدام تطبيقات الصحة النفسية عن بعد والثقة وفائدة هذه الخدمات وسهولة استخدامها.
- (٦) الفترة الزمنية المطلوبة للمشاركة: تعبئة الاستبيان ستستغرق ما بين ١٥ الى ٢٠ دقيقة.
- (٧) المخاطر: لا توجد مخاطر مرتبطة بهذه الدراسة
- (٨) الفوائد للمشارك والمجتمع: المشارك لن يحصل على فوائد مباشرة عند المشاركة في هذا البحث. نتائج هذا البحث قد تساهم في مساعدة مستخدمي ومطوري ومقدمي هذه الخدمات في تحسينها وتطويرها.
- (٩) حماية خصوصية المشارك وسرية البيانات: لا تلزمك الأسئلة في هذا الاستطلاع بالكشف عن أي معلومات تعريف شخصية كما اننا لن نجمع أي معلومات يمكننا استخدامها للتعرف عليك، لذا تظل ردودك مجهولة تمامًا. جميع البيانات ستكون مشفرة ومخزنة في قاعده بيانات محمية بكلمه مرور متاحه فقط لفريق البحث حصرا.
- (١٠) المشاركة في هذه الدراسة تطوعية ويمكنكم الانسحاب منها في أي وقت وهذا لن يؤثر على الخدمات التي تقدمها الدراسة.
- (١١) في حال المشاركة بمنح عينات لا يجوز عمل دراسات أخرى على العينات خاصتي دون الرجوع الى مرة أخرى مع الالتزام (من طرف الباحث أو الشركة الداعمة) بالتخلص من العينات الزائدة عن الحاجة.
- (١٢) شرح كيفية تعويض المشارك بالبحث في حال وقوع ضرر عليه ناجم عن مشاركته في البحث.
- (١٣) إذا كنت توافق على الاشتراك في هذه الدراسة، قم بالإشارة في المكان المناسب في الجزء التالي:

_____: لقد تم شرح كل المعلومات الواردة في هذه الاتفاقية.

_____: لقد قرأت وفهمت المعلومات الواردة في هذه الاتفاقية.

اسم المشارك: _____ توقيع: _____

اسم الأب / الأم / الراعي: _____ توقيع: _____

علاقة الراعي بالمشارك: _____



وكالة الجامعة للدراسات العليا والبحث العلمي
لجنة أخلاقيات البحث العلمي بجامعة الطائف
Scientific Research Ethics Committee

توقيع مسئول الدراسة: _____ التاريخ: ٢٠٢١/٠٦/١٥
١٤) أرقام وعناوين التواصل للحصول على أي معلومات تتعلق بالبحث، أو بحقوق المشارك، أو التبليغ في حال حدوث ضرر:
لجنة أخلاقيات البحث العلمي بجامعة الطائف: هاتف والبريد الإلكتروني:
الباحث: هاتف 0541118828 والبريد الإلكتروني: hmyami@tu.edu.sa

لجنة جامعة الطائف لأخلاقيات البحث العلمي	
تم التأكد من صحة المعلومات أعلاه وموافقتها مع نظام أخلاقيات البحث.	
موافقة اللجنة المقيمة للبحث:	موافق <input checked="" type="checkbox"/> غير موافق <input type="checkbox"/>
ملاحظات:	
رئيس اللجنة: د. / خالد السواط ... التوقيع: التاريخ: ٢٠٢١/١١/١٧	

(A2) Ethics approval from AUT Ethics Committee



Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

4 August 2021

Felix Tan
Faculty of Design and Creative Technologies

Dear Felix

Re Ethics Application: **21/256 Patients' Perceptions and Experiences of Telemental Health Applications in Saudi Arabia: A Study of Trust, Subjective Norms and Social Stigmatization**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 4 August 2024.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: Kch5007@autuni.ac.nz

تطبيقات الصحة النفسية

شاركنا تجربتك

هذه الدراسة تركز على فهم تصورات وتجارب مستخدمي تطبيقات الصحة النفسية عن بعد في المملكة العربية السعودية خاصة، وصمة العار المتعلقة بمن يعاني من مرض نفسي وتصورات من يعانون من مشاكل نفسية بالثقة في هذه الخدمات، وسهولة الاستخدام والفائدة من هذه التطبيقات.

- الاستبيان سيستغرق ١٠ دقائق من وقتك.
- مشاركتك في هذه الدراسة طوعية تماما.
- جميع اجاباتك سرية ومجهولة المصدر.
- لن يتم جمع أي بيانات تحدد هويتك.
- لا توجد أي مخاطر مرتبطة بمشاركتك في هذه الدراسة.



Appendix C: Questionnaire

(C1) Questionnaire in English

Telemental Health Applications Survey



This study focuses on patients' perceptions and experiences of Telemental Health Applications in Saudi Arabia.

Telemental Health refers to the use of several combined technologies which together enable patients to receive remote diagnosis, treatment and other mental health services. Telemental Health applications in Saudi Arabia include Estenarh, Labayh, Sanar, Seha and others. Such applications offer numerous benefits such as improved accessibility to mental health care and flexibility. This study focuses on examining patient trust, subjective norms, social stigmatization, usefulness and ease of use, and the extent to which these elements influence patients' use of Telemental Health applications.

You are invited to participate in this survey.

You will be asked about your perceptions and experiences of Telemental Health Applications.

It will take approximately 20 minutes to complete the questionnaire.

Your participation in this study is completely voluntary. All your answers are anonymous and confidential. There will be no data collected that identify you.

There are no foreseeable risks associated with your participation in this study.

By completing the survey, you give electronic consent to participate in this study. You can withdraw from the survey at any point and your answers will not be used in this study. Once you have completed and submitted the survey, your answers cannot be identified or withdrawn.

Thank you very much for your time and support.

Will I receive feedback on the results of this research?

Research findings will be posted on the Auckland University of Technology Thesis Link website (<https://thesislink.aut.ac.nz/>).

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Prof. Felix Tan, felix.tan@aut.ac.nz, (+649) 921 9999 ext. 6552

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTECH, ethics@aut.ac.nz, (+649) 9219999 ext. 6038.

Approved by the Auckland University of Technology Ethics Committee on 21 July 2021,
AUTECH Reference number 21/256

Section A: Demographic Questions

Age	<ul style="list-style-type: none">❖ Under 18❖ 18-24❖ 25-34❖ 35-44❖ 45-54❖ 55-64❖ 65 or above
Gender	<ul style="list-style-type: none">❖ Male❖ Female
Nationality	<ul style="list-style-type: none">❖ Saudi❖ Non-Saudi
Highest level of Education	<ul style="list-style-type: none">❖ No schooling completed❖ High school graduate❖ Diploma❖ Bachelor's graduate❖ Postgraduate
Marital status	<ul style="list-style-type: none">❖ Single❖ Married❖ Divorced❖ Widowed❖ Separated
Monthly Household Income	<ul style="list-style-type: none">❖ Less than 10000 SR❖ 10000 SR – 15000 SR❖ 16000 SR or more
Region	<ul style="list-style-type: none">❖ North region❖ Central region❖ East region❖ West region❖ South region
Have you used Telemental Health Applications?	<ul style="list-style-type: none">❖ Yes❖ No
If yes, which Applications?	<ul style="list-style-type: none">❖ Seha❖ Labayh❖ Istinarah❖ Sanar❖ Other...

How frequently do you use Telemental health Applications?	<ul style="list-style-type: none"> ❖ Very frequently ❖ Frequently ❖ Occasionally ❖ Rarely ❖ Very Rarely ❖ Never ❖ NA
What kind of therapy/ consultation did you receive through the Telemental Health Application?	<ul style="list-style-type: none"> ❖ Never used TMH Applications. ❖ Social Intervention ❖ Psychological Intervention ❖ Psychiatric Intervention ❖ Other...

Section B: Perceptions of Stigmatization by Others for Seeking Help (PSOSH)

Imagine you had an issue with your mental wellbeing and you could not solve this issue on your own. If you sought counselling services for your mental wellbeing, to what degree do you believe that the people you interact with would:

	Not at all	A little	Some	A lot	A great deal
React negatively to you	1	2	3	4	5
Think bad things of you	1	2	3	4	5
See you as seriously disturbed	1	2	3	4	5
Think of you in a less favorable way	1	2	3	4	5
Think you posed a risk to others	1	2	3	4	5

Section C: Subjective Norms

Subjective Norms refers to an individual's perception that most people who are important to him/her think he/she should or should not use TMH applications.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
People who influence my behavior think that I should use TMH applications	1	2	3	4	5	6	7
People who are important to me think that I should use TMH applications	1	2	3	4	5	6	7

Section D: Trust

Trust in Care Organization: refers to your belief as a patient, that a Health-care organization acts for you with your best interest in mind.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
TMH organizations have a good reputation	1	2	3	4	5	6	7
TMH organizations handle my personal information carefully	1	2	3	4	5	6	7
Telemental Health organizations take action when something goes wrong	1	2	3	4	5	6	7
TMH organizations make me feel safe	1	2	3	4	5	6	7
TMH organizations take my specific needs into account	1	2	3	4	5	6	7

Trust in Care Professional: This refers to your belief that a therapist acts for you with your best interests in mind.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
I trust my therapist's judgement about my medical care	1	2	3	4	5	6	7
My therapist provides me with all the information on all potential medical options	1	2	3	4	5	6	7
My therapist keeps all my medical information private	1	2	3	4	5	6	7
I always follow my therapist's advice	1	2	3	4	5	6	7

Trust in Treatment: This refers to your belief that the treatment you are receiving is effective.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
The treatment I receive is effective	1	2	3	4	5	6	7
It is clear to me what the treatment I receive entails	1	2	3	4	5	6	7
Together, my therapist and I made the choices for this treatment	1	2	3	4	5	6	7
The treatment I received is not helping me enough	1	2	3	4	5	6	7
It has been explained well to me what my treatment entails	1	2	3	4	5	6	7

Trust in Technology: This refers to your belief that using TMH applications' technology is safe and secure.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
When I use TMH applications, I am in control	1	2	3	4	5	6	7
Everything that I do on TMH applications remains private	1	2	3	4	5	6	7
The personal information that is stored on TMH applications will not get lost	1	2	3	4	5	6	7
TMH applications are easy to use	1	2	3	4	5	6	7
Legal policy and technological safeguards make TMH applications a safe environment	1	2	3	4	5	6	7

Trust in Telemental Health Service: This refers to your overall trust in TMH applications.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
I can trust TMH applications	1	2	3	4	5	6	7
I can trust that the possible problems with the TMH applications will be solved properly	1	2	3	4	5	6	7
I can trust TMH applications less than other online services.	1	2	3	4	5	6	7
I feel at ease when working with TMH applications	1	2	3	4	5	6	7
I do not like to enter my personal data on the TMH applications	1	2	3	4	5	6	7

Section E: Perceived Usefulness

Perceived Usefulness is the degree to which you believe that using TMH applications would improve your mental health.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
Using TMH applications enables me to receive faster treatment	1	2	3	4	5	6	7
Using TMH applications improves my health performance	1	2	3	4	5	6	7
Using TMH applications in my health management regimen betters my treatment	1	2	3	4	5	6	7
Using TMH applications helps me manage my health more effectively	1	2	3	4	5	6	7
Using TMH applications makes it easier to maintain my health	1	2	3	4	5	6	7
Overall, I find TMH applications useful	1	2	3	4	5	6	7

Section F: Perceived Ease of Use

Perceived Ease of use is the degree to which you believe that using TMH applications would be free of effort.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
Learning to use TMH applications is easy for me	1	2	3	4	5	6	7
I find it easy to get the TMH applications to do what I want it to do	1	2	3	4	5	6	7
My interaction with TMH applications is clear and understandable	1	2	3	4	5	6	7
I find TMH applications flexible to interact with	1	2	3	4	5	6	7
It is easy for me to become skillful at using TMH applications	1	2	3	4	5	6	7
I find TMH applications easy to use	1	2	3	4	5	6	7

Section G: Intention to Use

Intention to use refers to the strength of your intention to use TMH applications.

Answer the following questions indicating to what extent you agree or disagree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither	Somewhat Agree	Agree	Strongly Agree
Assuming I have access to TMH applications, I intend to use it	1	2	3	4	5	6	7
Given that I have access to the system, I predict that I would use it	1	2	3	4	5	6	7

(C2) Questionnaire in Arabic



تطبيقات الصحة النفسية عن بعد

السلام عليكم ورحمة الله وبركاته
هذه الدراسة تركز على تصورات من يعانون من مشاكل نفسية وتجاربهم لتطبيقات الصحة النفسية عن بعد في المملكة العربية السعودية.

الطب النفسي عن بعد يشير الى استخدام العديد من التقنيات التي تساعد على إيصال خدمات الصحة النفسية عن بعد. من ضمن ذلك تمكين المستخدمين من تلقي التشخيص عن بعد، والعلاج والخدمات النفسية الأخرى. في المملكة العربية السعودية يوجد العديد من تطبيقات الصحة النفسية مثل تطبيق استنارة، تطبيق لبيه، تطبيق سنار، وتطبيق صحة. تقدم هذه التطبيقات فوائد عديدة مثل تحسين الوصول الى خدمات الصحة النفسية ومرونة استخدامها. تهدف هذه الدراسة على فحص الثقة بتطبيقات الصحة النفسية، والمعايير الشخصية، والوصم الاجتماعي، والفائدة من وسهولة استخدام هذه التطبيقات. أيضا، تحديد مدى تأثير هذه العناصر على من يستخدم تطبيقات الصحة النفسية لتلقي العلاج.

انتم مدعو للمشاركة في هذه الاستبانة. سيتم سؤالك عن تجربتك وتصوراتك اتجاه استخدام تطبيقات الصحة النفسية لتلقي العلاج عن بعد. الاستبانة سيستغرق منك ٢٠ دقيقة لإكمالها.

مشاركتك في هذه الدراسة طوعي تماما وجميع اجاباتك سرية ومجهولة المصدر. لن يتم جمع أي بيانات تحدد هويتك ولا توجد أي مخاطر مرتبطة بمشاركتك في هذه الدراسة.

من خلال اكمالك لهذا الاستبيان، فإنك تمنح/ي الموافقة الالكترونية للمشاركة في هذه الدراسة. يمكنك الانسحاب من الاستبيان في أي وقت ولن يتم استخدام اجاباتك في هذه الدراسة. بمجرد الانتهاء من الاستبيان وارساله، لا يمكن سحب اجاباتك ولا تحديدها لكونها سرية ومجهولة المصدر.

شكرا جزيلا على وقتكم ودعمكم.

كيف تتلقى نتائج هذا البحث؟

سيتم نشر نتائج البحث على موقع جامعة اوكلاند للتكنولوجيا (<https://thesislink.aut.ac.nz/>).

ماذا تفعل إذا كان لديك مخاوف بشأن هذا البحث؟

إذا لديك مخاوف تتعلق بطبيعة هذا المشروع تواصل مع المشرف الأساسي للبحث، البروفيسور فيليكس. Prof. Felix Tan, felix.tan@aut.ac.nz, (+649) 921 9999 ext. 6552
او تواصل مع السكرتير التنفيذي لجامعة اوكلاند للتكنولوجيا عبر الايميل: ethics@aut.ac.nz, (+649) 9219999 ext. 6038

تمت الموافقة على هذه الدراسة من قبل لجنة الاخلاقيات بجامعة اوكلاند للتكنولوجيا، رقم المرجع: AUTECH 21/256 تاريخ ٢١ يوليو ٢٠٢١ ميلادي.

اسئلة عامة

العمر

اقل من ١٨

١٨ - ٢٤

٢٥ - ٣٤

٣٥ - ٤٤

٤٥ - ٥٤

٥٥ - ٦٤

٦٥ او اكثر

الجنس

ذكر

انثى

الجنسية

سعودي/ة

غير سعودي/ة

المستوى التعليمي

لم اكمل تعليمي

المرحلة الثانوية

دبلوم

بكالوريوس

دراسات عليا

الحالة الاجتماعية

- اعزب
- متزوج/ة
- مطلق/ة
- أرمل/ة
- منفصل/ة

مستوى الدخل الشهري

- اقل من ١٠٠٠٠ ريال
- ١٠٠٠٠ - ١٥٠٠٠ ريال
- ١٦٠٠٠ ريال او اكثر

منطقة المعيشة

- المنطقة الشمالية
- المنطقة الوسطى
- المنطقة الشرقية
- المنطقة الغربية
- المنطقة الجنوبية

هل سبق لك استخدام تطبيقات خدمات الصحة النفسية عن بعد؟

- نعم
- لا

ماهي تطبيقات الصحة النفسية التي استخدمتها؟

صحة

لييه

استشارة

سنار

أخرى

مامعدل استخدامك لتطبيقات خدمات الصحة النفسية عن بعد؟

كثير جدا

كثير

أحيانا

في النادر

نادر جدا

ابدا

لايوجد

مانوع العلاج/ الاستشارة التي تلقيتها من خلال استخدامك لتطبيقات الصحة النفسية عن بعد؟

استشارة اجتماعية

استشارة علاج نفسي

استشارة طب نفسي

أخرى

وصمة العار

انطباعك عن وصمة المرض النفسي التي يبديها الآخرون عندما تطلب المساعدة.

تخيل أن صحتك النفسية ليست على مايرام وأنك لم تتمكن من إيجاد حل للمشكلة دون المساعدة. إذا لجأت لخدمات الصحة النفسية لطلب الاستشارة، إلى أي مدى ستظن أن الذين تتعامل معهم يشعرون نحوه بالآتي:

أبدا	قليلا	بعض الشيء	كثيرا	كثيرا جدا	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يبدون ردة فعل سلبية نحوه
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يفكرون بأفكار سيئة عنك
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يرون أنك شخص مضطرب جدا
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ينظرون إليك نظرة غير محبذة
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يعتقدون أنك تشكل خطرا على الآخرين

المعايير الشخصية

المعايير الشخصية تشير الى اي درجة تتصور ان معظم الأشخاص المهمين بالنسبة لك يعتقدون انه يجب او لايجب عليك استخدام تطبيقات الصحة النفسية عن بعد.

الرجاء الإجابة على الاسئلة التالية مشيرا الى أي مدى توافق او تعارض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	الأشخاص الذين يؤثرون في سلوكي يروا انه يجب علي استخدام تطبيقات الصحة النفسية عن بعد
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	الأشخاص المهمون بالنسبة لي يروا انه يجب علي استخدام تطبيقات الصحة النفسية عن بعد

الثقة

الثقة في منظمات الرعاية

تشير الى ايمانك كمستخدم بأن المنظمات التي تقدم خدمات الصحة النفسية تعمل لأجلك ولصالحك.

الرجاء الإجابة على الأسئلة التالية مشيراً الى أي مدى توافق أو تعارض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تتمتع منظمات خدمات الصحة النفسية بسمعة جيدة
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	منظمات خدمات الصحة النفسية حريصة في تعاملها مع بياناتي الشخصية
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تتفاعل منظمات خدمات الصحة النفسية عند حدوث مشكلة
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تشعرني خدمات الصحة النفسية عن بعد بالأمان
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تقوم منظمات خدمات الصحة النفسية بأخذ احتياجاتي الخاصة بعين الاعتبار

الثقة في الطبيب

تشير إلى أي درجة تعتقد أن الاستشاري يعمل من أجلك ولصالحك.

الرجاء الإجابة على الأسئلة التالية مشيراً إلى أي مدى توافق أو تعارض على كل عبارة.

أوافق بشدة	أوافق	أوافق بعض الشيء	لا أوافق ولا أعارض	أعارض بعض الشيء	أعارض	أعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	أثق في حكم أخصائي العلاج النفسي فيما يخص رعايتي الصحية.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يمدني أخصائي العلاج النفسي بجميع المعلومات اللازمة عن الخيارات الطبية الممكنة.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يحافظ أخصائي العلاج النفسي على سرية معلوماتي الطبية.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	دائمًا أتبع نصائح أخصائي العلاج النفسي.

الثقة في العلاج

الثقة في العلاج تشير الى أي درجة تعتقد بأن العلاج الذي تتلقاه عبر تطبيقات الصحة النفسية فعال.

الرجاء الإجابة على الاسئلة التالية مشيرا الى أي مدى توافق أو تعارض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	العلاج الذي اتلقاه فعال.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ما يتضمنه العلاج الذي اتلقاه واضح بالنسبة لي.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تشاركنا، أنا وأخصائي العلاج النفسي، في اختيار العلاج الذي اتلقاه.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	العلاج النفسي الذي تلقينته ليس مفيدا بالنسبة لي.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تلقيت شرحا وافيا عما يتضمنه العلاج.

الثقة في التكنولوجيا

الثقة في التكنولوجيا تشير الى أي درجة تعتقد ان استخدام تكنولوجيا تطبيقات الصحة النفسية امنه و مضمونه.

الرجاء الإجابة على الاسئلة التالية مشيرا الى اي مدى توافق او تعارض على كل عبارة.

اعارض بشدة	اعارض	لا اوافق ولا اعارض	اوافق بعض الشيء	اوافق بشدة
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
عندما أستخدم تطبيق خدمات الصحة النفسية، أشعر بأنني متحكم بالأمور.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
كل ما أفعله في تطبيقات خدمات الصحة النفسية يبقى سرياً.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
بياناتي الشخصية المخزنة في تطبيق خدمات الصحة النفسية لن تضيع.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
تطبيقات خدمات الصحة النفسية سهلة الاستخدام.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
القوانين والإجراءات الوقائية التقنية تجعل من تطبيقات خدمات الصحة النفسية بيئة آمنة.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

الثقة في تطبيقات الصحة النفسية عن بعد

تشير الى ثقتك العامة في تطبيقات الصحة النفسية.

الرجاء الإجابة على الاسئلة التالية مشيرا الى اي مدى توافق او تعارض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يمكنني أن أثق في تطبيقات خدمات الصحة النفسية.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	يمكنني أن أثق في أن المشاكل التي يمكن أن تحدث مع تطبيقات خدمات الصحة النفسية سوف تُحل كما يجب.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ثقتي في خدمات الصحة النفسية أقل من ثقتي في الخدمات الصحية الأخرى المتوفرة عبر الانترنت.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	أشعر بالطمأنينة أثناء استخدام تطبيقات خدمات الصحة النفسية.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	لا أحب إدخال بياناتي الشخصية في تطبيقات خدمات الصحة النفسية.

الفائدة المدركة

الفائدة المدركة تشير الى الدرجة التي تعتقد ان استخدام تطبيقات الصحة النفسية من شأنها تحسين صحتك.

الرجاء الإجابة على الأسئلة التالية مشيراً الى أي مدى توافق أو تعارض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	استخدام تطبيقات الصحة النفسية تساعد في الحصول على العلاج في وقت أسرع.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	استخدام خدمات الصحة النفسية ستؤدي الي تحسين صحتي النفسية
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	استخدام تطبيقات الصحة النفسية لإدارة صحتي تمكنني من الحصول على علاج أفضل.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	استخدام تطبيقات الصحة النفسية تساعدني على إدارة صحتي النفسية بصفة أكثر فعالية.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	استخدام تطبيقات الصحة النفسية تسهل علي الاعتناء بصحتي والمحافظة عليها.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	بصفة عامة، أرى ان تطبيقات الصحة النفسية هي تطبيقات مفيدة.

الانطباع حول سهولة الاستخدام

انطباعات حول سهولة استخدام تطبيقات الصحة النفسية تشير الى أي درجة تعتقد ان استخدام هذه التطبيقات خاليا من الجهد.

الرجاء الإجابة على الأسئلة التالية مشيرا الى أي مدى توافق او تعترض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تعلم استخدام تطبيقات الصحة النفسية سهل علي.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	من السهل علي استخدام تطبيقات الصحة النفسية بالشكل الذي اريده
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	تفاعلي مع تطبيقات الصحة النفسية واضحا ومفهوم
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	أرى ان تطبيقات الصحة النفسية تتميز بمرونة التفاعل معها.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	من السهل علي أن أصبح ماهراً في استخدام تطبيقات الصحة النفسية.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	أرى انه من السهل استخدام تطبيقات الصحة النفسية.

نية الاستخدام

نية الاستخدام تشير الى قوة نيتك في استخدام تطبيقات الصحة النفسية عن بعد.

الرجاء الإجابة على الأسئلة التالية مشيرا الى اي مدى توافق او تعارض على كل عبارة.

اوافق بشدة	اوافق	اوافق بعض الشيء	لا اوافق ولا اعارض	اعارض بعض الشيء	اعارض	اعارض بشدة	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	إذا سمحت لي الفرصة، أؤتي استخدام تطبيقات الصحة النفسية في المستقبل.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	نظرا لكوني قادرا على استخدام تطبيقات الصحة النفسية فأبني أعزم استخدامها.