

## **Gen-Z Reaction towards Telemedicine: Measurement on Self-efficacy as Psychological Quantitative Mediator**

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### **ABSTRACT**

Telemedicine has consistently reported low adoption among Malaysian citizens, especially among University Gen-Z. Therefore, this study aims to investigate telemedicine adoption among Malaysian Gen Z consumers and how self-efficacy mediates the relationship between consumer perceptions. A questionnaire was distributed to 408 Malaysian University Gen Z respondents aged 18 and above living in the Kuala Lumpur urban area via face-to-face survey. After data screening for straight lining and incomplete responses, 395 valid cases were retained for analysis. Smart PLS was then employed to examine the direct association between the variables, including the mediator. The results showed that performance expectancy and trust have no direct relationship with telemedicine adoption among Gen-Z; however, when self-efficacy was used as a mediator, it showed a positive mediating effect on all tested independent variables and telemedicine adoption. The telemedicine framework in this study may offer a deeper understanding of the issues faced in telemedicine adoption

in Malaysian urban areas. This study concludes that the psychological bridge that self-efficacy posits has a positive effect on the adoption of telemedicine among urbanites. In addition, the right mechanisms are provided to healthcare providers and policymakers to enhance future adoption of telemedicine.

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## INTRODUCTION

The issues of an ageing population and healthcare accessibility have placed a strain on the current healthcare system worldwide (Tan et al., 2024). A report by the World Health Organisation highlighted that global healthcare spending has doubled over the past two decades, reaching USD 9 trillion and 10.8% of GDP in 2020 (an increase from 8.5% in 2000). Looking at the Malaysian ageing population as reported by the Department of Statistics Malaysia, it is expected that by 2023, the number will exceed by 15% from the total population, making the use of telemedicine in Malaysia's healthcare system crucial (Lawrence et al., 2022). This trend will create a significant burden on the Malaysian healthcare system in the long run (Tan et al., 2024). Therefore, the introduction to the telemedicine concept is considered critical in bridging the gap. According to Thabet et al. (2024), telemedicine is the delivery of health care services in which distance is the critical factor. Despite the quick growth in telemedicine research, the field remains underexplored, creating gaps in adoption rates (Lei et al., 2025). Added that the healthcare workforce faces critical shortages, exacerbated by "brain drain," issues faced with approximately 20% of trained healthcare professionals migrating annually to other countries, had further strained the system's capacity (Ibrahim & Kunjuraman, 2025). In today's age, the global telemedicine market has demonstrated substantial growth potential with the digital medicine showing great improvement

in health screening by addressing global problems (e.g., which include screening diseases, diabetes, epidemics, ageing, mental illness, and addictions (Vidal-Silva et al., 2024). Researchers have highlighted a trend in telemedicine adoption among Gen X compared to Gen Z, leaving a significant gap in understanding the mechanisms underlying adoption among younger consumers (Jawad et al., 2023). According to Slepian et al. (2024), Gen Z is defined as those born between 1997 and 2012, representing a critical demographic for sustainable telemedicine implementation due to their digital nativity and future healthcare consumption patterns. If this is not tapped now, it is believed that the future healthcare system in Malaysia will be further strained and downgraded. Despite the performance expectancy, which has long been discussed as a factor affecting telemedicine adoption, self-efficacy is seldom seen as an important psychological factor that would further enhance the telemedicine adoption among Gen Z consumers (Yin et al., 2024). Moreover, confidence in addressing technological and service quality factors in healthcare services to enhance telemedicine adoption rates was often left out. For example, building consumer confidence among University Gen Z consumers should be seen as a crucial factor in the adoption rate of telemedicine in urban areas. This is because a simple psychological change can lead to greater adoption of the telemedicine concept, which could further improve overall healthcare

operations in Malaysia (Jawad et al., 2023). A study done by Loo et al. (2023) has enhanced the understanding of the telemedicine concept. They have defined it as a complex behavioural phenomenon which is influenced by several factors. This includes technological, individual, and contextual factors. The current scenario of Malaysian telemedicine adoption shows varying patterns across demographic groups. A greater openness to adopt digital health solutions is shown by a younger group. The remaining are still influenced by perceptions of the system itself (Jawad et al., 2023; Tan et al., 2024). The initiatives by Malaysian towards telemedicine development can be clearly seen through several initiatives. This includes the Telemedicine Blueprint and the Malaysia Digital Health Blueprint (Yin et al., 2024). Despite the government's efforts to foster greater telemedicine services, the implementation remains hampered. There are several factors associated, including regulatory barriers, technological limitations, and varying levels of consumer adoption (Bouziane et al., 2022). Apart from that, factors like price value were also further discussed as a salient factor affecting the adoption of telemedicine (Amin et al., 2022). The construction reflects consumers' assessment of whether the benefits derived from telemedicine services justify the associated costs, including direct fees, time investments, and opportunity costs. Apart from that, the trust elements in telemedicine, which encompass multiple dimensions, including

trust in healthcare providers, technology platforms, and data security measures, were also discussed as an influential factor in the telemedicine adoption (Malati et al., 2024). According to Yin et al. (2024), due to the scarcity of studies that have focussed on the phenomenon of how Malaysian consumer behaviour, especially among the Gen Z in Malaysian universities, reacts towards the telemedicine adoption, with the mediating factor of self-efficacy, there is an urgent need to study these issues to further understand the effect of the psychological perspectives. In addition, the recent study on the adoption of telemedicine was carried out among the old citizens (Jawad et al., 2023), leaving the gaps on understanding the Gen Z behaviour where their digital nativity is receptive to telemedicine but also demanding of seamless, secure and user-friendly experience, has created both opportunities and barriers for adoption (Bouziane et al., 2022). Synthesising across these streams, three primary gaps emerge. First, no published study has simultaneously examined all four consumer perception constructs (PE, PV, PR, and Trust) with self-efficacy as a mediator in the Malaysian telemedicine context. Second, Gen Z's digital nativity fundamentally alters the theoretical predictions derived from older adult or mixed-age samples. Third, the mediation mechanism linking perceptions to adoption remains underspecified in the Malaysian literature. The present study addresses all three gaps within a unified DOI-SCT framework.

## LITERATURE REVIEW

### Theoretical Framework

The key frameworks that enhance understanding of adoption and the relationship between performance expectancy, price value, trust, perceived risks, and self-efficacy are Diffusion of Innovation (DOI) theory and Social Cognitive Theory (SCT).

### Diffusion of Innovation (DOI)

According to the DOI theory, developed by Rogers (1962), people are grouped into five categories, namely, innovators, early adopters, early majority, late majority and laggards. Rogers (2003), further developed the theory that explains how innovations spread through social systems, identifying five key attributes that influence adoption and highlighting the elements of relative advantage, compatibility, complexity, trialability, and observability most likely to affect adoption.

This paradigm underscores the need to address the adoption movement, especially when the theory seeks to explain how and why it can be sustained over a long period. One of the key aspects of the theory's adoption was its use in the public health area to encourage the population to adopt new or healthy behaviours.

### Social Cognitive Theory

SCT, developed by Bandura (1986), explains human behaviour through the interaction of personal, behavioural, and environmental factors. A central discussion

on the predictor, as discussed by Bandura (1997) in social cognitive theory, is self-efficacy, which has consistently emerged as a significant predictor of health behaviour adoption. Therefore, integrating SCT and DOI in this study would prepare a universal understanding of the adoption mechanism by addressing both innovation characteristics and individual behavioural factors.

In addition, the theoretical integration in this study poses several advantages over traditional technology acceptance models. Although it is widely known that TAM and UTAUT2 provide a robust framework for technology adoption (Harris et al., 2025), both models still lack emphasis on the innovation life cycle and psychological readiness. Thus, by integrating the DOI and SCT, these gaps are addressed by combining innovation-diffusion attributes like trialability and observability with behavioural constructs. Factors like self-efficacy were believed to offer a more holistic explanation of Gen Z's adoption behaviour.

### Telemedicine Adoption in the Malaysian Context

Adoption trends of Telemedicine in Malaysia differ greatly among demographic groups, with younger users showing a greater openness to digital health solutions while still being impacted by factors such as confidence in digital engagement, cost considerations, perceptions of system utility, and data security concerns (Jawad et al., 2023; Tan et al., 2024).

Through programmes like the Malaysia Digital Health Blueprint in 2021 (Malaysia Healthcare Travel Council, 2021) and Telemedicine Blueprint, which started in 1997, had shown some efforts to improve the digital health strategies accessibility of digital service efficiency by the Malaysian government (Ministry of Health, 1997). This is merely a reflection of the commitment to the development of telemedicine in Malaysia (Wahab et al., 2023). However, differing degrees of consumer adoption, technological constraints, and regulatory impediments have made implementation of telemedicine difficult (Bouziane et al., 2022). To better forecast adoption behaviour, recent empirical research has started to concentrate on combining behavioural characteristics with classic innovation theory. In addition, Yin et al. (2024) discussed the issues. They had focussed on several factors that may affect telemedicine adoption. In conclusion, they found that one of the strongest factors contributing to telemedicine adoption is performance expectancy.

### **Performance Expectancy and Telemedicine Adoption**

Performance expectancy is considered a key element in shaping the adoption in each context (Alam et al., 2020). Generally, the definition agrees with what an individual believes that using a specific technology will improve their performance (Suzuki et al., 2020). In conclusion, this construct has emerged as a constant predictor of telemedicine adoption across diverse cultural contexts. In a normal healthcare setting,

this construct is based on the beliefs about improved health outcomes. In addition, it also provides access to care and more efficient well-being management (Bouziane et al., 2022). The conclusion established that greater performance expectancy will improve the adoption of telemedicine. Thus, in turn, it affects the country's improved healthcare system. A study conducted by Kaium et al. (2024) stated that performance expectancy demonstrated a significant positive relationship with adoption intentions. This empirical study provides support for the significance of performance expectancy in telemedicine adoption among consumers abroad. Another study by Diet et al. (2023) also found the similarity in their findings, where a set of physicians were interviewed and gave their agreement on the performance expectancy and the adoption of telemedicine possesses a strong correlation. Thus, this study assumes the following:

H1: The adoption of telemedicine among Malaysian Gen Z consumers is influenced by performance expectancy

### **Price Value and Telemedicine Adoption**

According to Vidal-Silva et al. (2024), price value is the cognitive trade-off between the monetary costs of utilising a technology and its perceived benefits. In healthcare contexts where cost considerations significantly influence consumer decisions or adoption of new methods, price value becomes particularly salient for adoption behaviour (Amin et al., 2022). The construct reflects

consumers' assessment of the telemedicine services they used. The justification was associated with costs, including direct fees, time investments, and opportunity costs.

While Vidal-Silva et al. (2024) support a positive price value–adoption relationship, Brahmayudha & Legowo (2024) find no such effect in the Indonesian context. This empirical inconsistency underscores the need to examine whether price sensitivity manifests differently among a Gen Z cohort with distinct cost structures and consumption expectations. Given the debate over the price value, this study considers this factor to further examine the relevance of the construct in the Malaysian context. Thus, the following hypothesis was proposed:

H2: The adoption of telemedicine among Malaysian Gen Z consumers is influenced by price value

### **Perceived Risk and Telemedicine Adoption**

Perceived risk has always been discussed as affecting the uncertainty and adoption of telemedicine (Klaver et al., 2021). Perceived risks in healthcare settings include privacy risks (data security issues), technology risks (system reliability issues), and performance risks (concerns about the efficacy of services) (Cocosila & Turel, 2022). Empirical studies consistently show that perceived risk negatively affects the uptake of telemedicine. Bakshi and Tandon (2021) found that perceived risk had a significantly reduced adoption rate. In addition, the study also revealed that

higher levels of risk perception among participants had consistently shown reduced telemedicine adoption. Wu and Ho (2024) also examined several risk factors. This includes risks to one's health and privacy as barriers to telemedicine adoption. They found that individuals with lower levels of education are more likely to reject telemedicine services. Hence, the following hypothesis was anticipated:

H3: The adoption of telemedicine among Malaysian Gen Z consumers is influenced by perceived risks

### **Trust and Telemedicine Adoption**

The concept of trust in the context of telemedicine often encompasses multiple dimensions. This includes trust in healthcare providers, technology platforms, and data security measures (Harris et al., 1995; Malati et al., 2024). Trust is also defined as the readiness to be vulnerable. This includes several expectations regarding service provision. In healthcare, vulnerability is evident when medical information and service failure are projected. Past research has highlighted that the element of trust always plays a critical role in influencing telemedicine adoption (Kuen et al, 2023). This was further supported by a study conducted in Indonesia by Alviani et al. (2023), who investigated telemedicine adoption and trust factors and found a positive association between telemedicine service adoption. Their study clearly showed that individuals with strong faith in the reliability of healthcare services are more

likely to adopt telemedicine services. This was further supported by a recent study by Ekaimi et al. (2024), which highlighted a positive relationship between the teleconsultation adoption and the effect of trust on adoption behaviour. The research emphasised that patients who express greater trust in the telemedicine system are more likely to use it because they believe it maintains confidentiality, even in remote delivery contexts. Trust dimension is critical to telemedicine implementation, and supported by Kuen et al. (2023), who had demonstrated that trust in the technology and healthcare providers positively influenced adoption decisions. Therefore, the following hypothesis was proposed:

H4: The adoption of telemedicine among Malaysian Gen Z consumers is influenced by trust

### **Testing the Self-efficacy as a Mediating Effect in Telemedicine Adoption**

In this study, testing self-efficacy as a key mediating factor (Baron & Kenny, 1986) in the adoption of health technology is rooted in Social Cognitive Theory developed by Bandura (1997), who defined self-efficacy as the conviction that one can successfully carry out the actions necessary to achieve particular goals. Self-efficacy in telemedicine contexts refers to users' confidence in their ability to use digital health platforms effectively and efficiently (Liu et al., 2020). Confidence in this research aligns with Bandura's framework, which refers to an individual's belief in their

capability to execute tasks effectively, as it relates to navigating telemedicine platforms.

Self-efficacy was selected as a sole mediator due to its strong empirical support as a predictor of health technology adoption (Bandura, 1997; Wang et al., 2022). Constructs like perceived behaviour control overlap conceptually with self-efficacy, while health anxiety is a context-specific construct and thus is seen as less relevant for a digitally native Gen Z (Pramudita et al., 2023). The mediating role of self-efficacy is strongly supported by recent empirical research (Wang et al., 2022), which summarises the mediating effect of self-efficacy on the association between eHealth literacy and health-promoting behaviours among Chinese older adults living in the community. Zhao et al. (2024) highlighted the significance of eHealth literacy in educational settings by finding that among nursing students, perceived social support only led to higher eHealth literacy when mediated by self-efficacy. According to An et al. (2024), among older adults who suffer from technology anxiety, the adoption of digital public services was impacted by anxiety in an indirect way through self-efficacy, where a decrease in confidence brought on by anxiety led to a decreased intention to use technology. When Liu et al. (2023) found that adults with higher self-efficacy in using mobile apps were more satisfied with and preferred online health services over in-person visits, they demonstrated the clinical relevance of self-efficacy mediation. This result suggests that in healthcare settings, confidence has

a direct impact on behavioural preferences and adoption. Thus, this study hypothesises the following:

H5: Self-efficacy mediates the relationship between performance expectancy and telemedicine adoption among Malaysian Gen Z consumers

H6: Self-efficacy mediates the relationship between price value and telemedicine adoption among Malaysian Gen Z consumers

H7: Self-efficacy mediates the relationship between trust and telemedicine adoption among Malaysian Gen Z consumers

H8: Self-efficacy mediates the relationship between perceived risk and telemedicine adoption among Malaysian Gen Z consumers

### Conceptual Framework

The discussion in the literature review section supports the association between all independent variables (Bakshi & Tandon, 2021; Cocosila & Turel, 2022; Wu & Ho, 2024) tested in this study towards the dependent variable (Bouziane et al., 2022), including the mediating effect (Wang et al., 2022). However, in the Malaysian context, very few investigations have been conducted on the influence of all the variables mentioned on the adoption of telemedicine practice. It is important to note that individuals staying in different areas might respond differently to telemedicine adoption practices. Therefore, the psychological aspects of self-efficacy as a mediator, measuring the relationship between the stated factor that could possibly affect telemedicine adoption, are deemed important. The conceptual framework of the current study is presented in Figure 1.

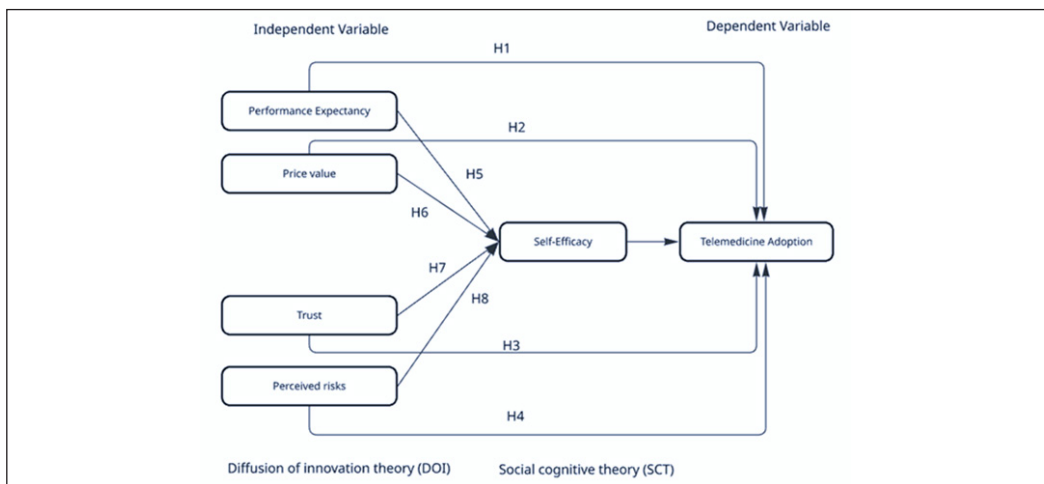


Figure 1. Research framework

## METHODOLOGY

### Research Design

A quantitative research design was used to facilitate the testing of the objective of the study in a systematic manner, thus elucidating the anticipated correlations among variables and measuring the mediating effect (Alviani et al., 2023). Quantitative study is deemed as most suitable for the current study because it can facilitate the collection of accurate data, and that could further enhance the representativeness of the population through the response received (Vidal-Silva et al., 2024). Therefore, the study adopts a similar approach to the quantitative method to measure its objective and test the hypotheses. The study was conducted among the 395 Klang Valley University students who live and study in Klang Valley, aged 18 years and above. Convenience sampling was chosen due to feasibility and cost constraints (Alam et al., 2020), targeting Gen Z in Malaysian urban universities where telemedicine exposure is higher. Stratified sampling was impractical given resource limitations in the current study context (Thabet, 2024). Given the study nature, targeting the sample, which consists of Malaysian university Gen Z consumers aged 18 and above residing and studying in urban areas, with or without prior telemedicine experience, allows for a more realistic exploration of their readiness and experience regarding the issue of investigating. While a formal external verification was beyond the scope of the current study design, the questionnaire did include a screener item regarding prior telemedicine experience.

The decision to sample from urban universities reflects the higher telemedicine exposure and digital infrastructure availability in the Klang Valley, but this necessarily limits the generalisability of findings to urban-dwelling, university-enrolled Gen Z individuals. The experiences of rural, vocationally trained, or economically disadvantaged Gen Z cohorts may differ substantially and warrant dedicated investigation. Based on the demographic information of the respondents reached in this study, the number of males was 258 (65.3%) compared to 137 females (34.7%). From the total respondents, 42.3% aged between 18 and 20 years old and above, 38.2% aged 21-23 years, 15.4% aged 24-26 years, and 4.1% aged 27-28 years. Most respondents were full-time students (67.3%), followed by part-time workers (15.4%) and self-employed (3.5%). The exclusion of responses with straight-lining patterns or insufficient data reduced possible bias but may have limited representativeness.

The sample for this study was surveyed using a face-to-face platform where the questionnaire was distributed through the university campus in public and private universities in the Kuala Lumpur area. This method allows data collection within a suitable time frame (Alam, 2020) for the study. To mitigate common method bias, questionnaire items were randomised, and anonymity was assured (Dang et al., 2025). Data collection for this study was completed in 3 months, which started in early April to June 2025 with 395 valid responses.

Although the sample size was determined using the Krejcie and Morgan table (Krejcie & Morgan, 1970), a post-hoc power analysis using G\*Power confirmed that  $n = 395$  achieves statistical power exceeding 0.99 ( $f^2 = 0.15$ ,  $\alpha = 0.05$ , five predictors), satisfying requirements for robust structural model estimation. After data screening from 408 responses received, 395 responses were considered valid and proceeded to data analysis, as this exceeded the minimum value recommended by Krejcie & Morgan (1970) and met the PLS-SEM requirements for complex models (Hair et al., 2021). Data screening involved the removal of 13 cases exhibiting straight-lining patterns (identical responses across all items) and incomplete questionnaires. No imputation was required as excluded cases represented <4% of the total dataset, below the 5% threshold that would necessitate formal missing data treatment (Hair et al., 2021).

An item for each construct was adapted from an established scale (Thabet, 2024; Vidal-Silva et al., 2024) and further modified to better align with the Malaysian cognitive context. Adaptation involved minor wording changes, after the expert review, which did not alter the conceptual meaning. Content validity was conducted and verified through five academics and a clinical psychologist, ensuring that construct validity was not compromised.

Beyond the expert review, back translation (Hair et al., 2021) was also employed to ensure semantic equivalence between the English and Bahasa Malaysia versions. Each construction used in this study was conceptualised in accordance with

the local context and the study population. A scale for measuring telemedicine adoption, developed by Thabet (2024), was adapted in this study.

## Measurements

This study measures telemedicine adoption from behavioural intention rather than actual usage, as the survey measured respondents' willingness and confidence to adopt the telemedicine services. A total of 26 questions were used to evaluate telemedicine adoption in this study. A scale developed by Thabet (2024) was employed in this study. Five items were constructed under the performance expectancy to measure adoption, with participants scoring from 1 (i.e., "strongly disagree") to 5 (i.e., "strongly agree"). A Cronbach alpha value for the scale was above 0.8, indicating reliability. Another five items were constructed under the Perceived Risk (PR) with the same 1 to 5 scale, yielding a score of 0.80 for Cronbach's alpha, indicating reliability of the questionnaire. Measurement of Price Value (PV) in this study consisted of 3 items, of which 1 item was dropped due to a score below 0.7 (Hair et al., 2021). The item PV4 ("Using telemedicine saves me significant money compared to traditional healthcare") was dropped because its outer loading (0.58) fell below the accepted threshold of 0.70 (Hair et al., 2021). Conceptually, this item captured direct monetary savings, a dimension that may be less salient to Gen Z students who are often covered under parental or institutional healthcare plans. Removal of PV4 did not alter the

conceptual scope of Price Value, as the remaining three items adequately captured the trade-off between perceived benefits and indirect costs (time and convenience). The Cronbach's Alpha for overall perceived value exceeded 0.8. The items under Self-Efficacy (SE) comprise four items with a Cronbach's value of above 0.8 as well. Five items were then constructed under the Trust (T) elements to measure telemedicine adoption, and the Cronbach's alpha for these items is above the threshold. This indicates that a good reliability has been shown.

### **Ethical Considerations**

Ethical measures were strictly followed during the data collection. All respondents were informed of their consent requirements before their involvement, confirming their understanding of the research objectives, their voluntary participation, and their right to withdraw at any time (Resnik, 2020). In addition, confidentiality was maintained by ensuring that anonymisation was secure throughout data collection. A brief introduction video was also distributed to all participants. This serves as the first stage of support to ease their participation throughout the survey.

### **Data Analyses**

Normality was assessed using skewness and kurtosis in SPSS. The non-normality justified the use of Smart PLS-SEM version 4, which is seen as robust to distributional assumptions (Hair et al., 2016). In addition, using SmartPLS is deemed more suitable for measuring the

predictive-oriented research and theory development. This is mainly due to its primary strength in measuring a variance-based approach to research. On the other hand, AMOS and Mplus are primarily designed for theory confirmation using covariance-based SEM (Hair et al., 2025). Given the nature of the research, which focuses on predicting urban behaviour towards telemedicine adoption, Smart PLS was used.

## **RESULTS AND DISCUSSION**

### **Reliability and Validity**

The measurement model was first assessed for internal consistency reliability, convergent validity, and discriminant validity, following Hair's (2016) guidelines. This was done before the hypothesis was evaluated. In assessing construct reliability, both Cronbach's Alpha (CA) and Composite Reliability (CR) were calculated as shown in Table 1. Though Cronbach's Alpha values in this study exceeded 0.8, this indicates strong internal consistency among the variables measured rather than item redundancy. Factor loadings values had further (all > 0.75), and AVE (> 0.50) confirmed that each item contributed uniquely to its construction, mitigating concerns about multicollinearity. The measurement model in PLS-SEM, which serves as a confirmatory factor analysis, was used to evaluate dimensionality. Before structural testing, construct validity was verified using outer loadings, AVE, and discriminant validity (Fornell-Larcker and HTMT).

Table 1

*Reliability and validity statistics for all constructs: Cronbach's Alpha, composite reliability, and Average Variance Extracted (AVE)*

	Item	Cronbach's Alpha	Composite Reliability (rho a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Performance Expectancy	5	0.886	0.888	0.916	0.689
Perceived Risk	4	0.891	0.894	0.920	0.698
Perceived Value	3	0.839	0.841	0.903	0.756
Self Efficacy	4	0.832	0.840	0.888	0.665
Trust	5	0.882	0.885	0.914	0.681
Telemedicine Adoption	4	0.889	0.890	0.923	0.751

### Coefficient of Determination, Effect Size, and Collinearity Statistics of Measurement

Table 2 and Figure 2 presents the discriminant validity assessed using the Fornell-Larcker criterion and the HTMT ratio. All HTMT values below 0.85 confirm that the constructions were distinct (Henseler et al., 2015).

Following is the  $R^2$  (Telemedicine Adoption) value reported = 0.621;  $R^2$  (Self-Efficacy) = 0.543, with an Adjusted  $R^2$  (TA) = 0.617; moreover, the Adjusted  $R^2$  (SE) had indicated a value of 0.538. Where as the  $f^2$  values: PE→SE = 0.11 (small-medium); PR→SE = 0.09; PV→SE = 0.06; T→SE = 0.10; SE→TA = 0.38 (large). The  $Q^2$  value (Stone-Geisser): TA = 0.451; SE = 0.347 (both >0, confirming predictive relevance). Whereas the VIF values for all constructs ranged from 1.82 to 2.71, well below the threshold of 5.0 (Hair et al., 2021), confirming no multicollinearity concern.

### Structural Model

Smart PLS shown in Table 3 was used to test the results on hypothesis testing. Performance expectancy's lack of significance may be due to Gen Z's innate belief that digital technologies are helpful, which makes psychological preparedness a more important element. This is consistent with research indicating that confidence and perceived risk are more important to digital natives than performance factors. Rather than model misspecification, contextual circumstances are probably responsible for the negligible trust-adoption route in this study. The apparent requirement for more trust in telemedicine platforms may be diminished by Malaysia's well-established healthcare credibility.

### Mediation Effects

In accordance with Hair et al. (2021), mediation effects were evaluated using bootstrapping with 5,000 resamples and 95% confidence intervals.

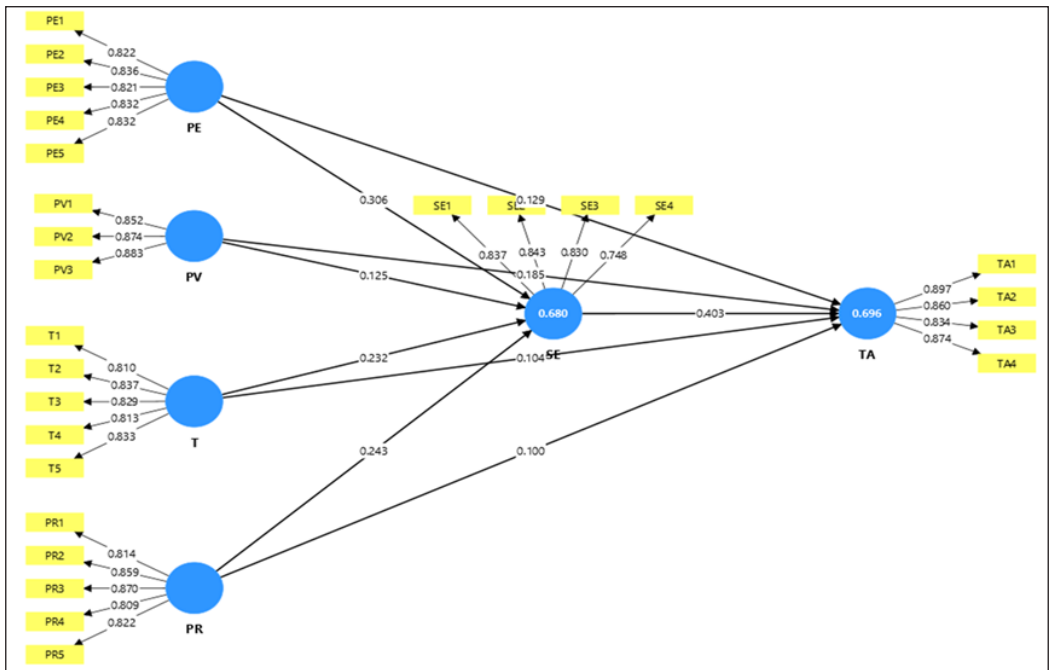


Figure 2. Measurement model (outer loadings)

Table 2  
Discriminant validity using the Fornell-Larcker criterion

	PE	PR	PV	SE	T	TA
Performance Expectancy	0.829					
Perceived Risk	0.741	0.835				
Perceived Value	0.792	0.724	0.87			
Self-Efficacy	0.772	0.731	0.728	0.815		
Trust	0.809	0.738	0.8	0.758	0.825	
Telemedicine Adoption	0.745	0.7	0.736	0.789	0.735	0.866

Table 3  
Hypothesis testing result for a direct relationship between the independent variable towards the telemedicine adoption

	Path Coefficient ( $\beta$ )	Standard Deviation	T statistics	P Values	Decision
(H1) PE -> TA	0.129	0.084	1.540	0.062	Unsupported
(H2) PV -> TA	0.100	0.058	1.716	0.043	Supported
(H3) PR -> TA	0.185	0.063	2.944	0.002	Supported
(H4) T -> TA	0.104	0.070	1.476	0.070	Unsupported

The Smart PLS shown in Table 4 was used to test all H5-H8, which showed a positive result. Despite the small size of some  $\beta$  values, their statistical significance indicates minor but significant impacts. In practical terms, this means that price-value and risk-reduction-focused interventions can still result in quantifiable increases in adoption.

The research results show small mediation effects in  $\beta$  values for H7 (PV  $\rightarrow$  SE  $\rightarrow$  TA;  $\beta = 0.050$ ) and H6 (PR  $\rightarrow$  SE  $\rightarrow$  TA;  $\beta = 0.098$ ), which are modest in magnitude. Even modest indirect effects have practical significance when designing targeted adoption interventions.

## DISCUSSION

Overall, the study's findings show that most of the hypotheses tested were supported (Bakshi & Tandon, 2021; Hidayah et al., 2024; Loo et al., 2023; Pramudita et al., 2023), except for a direct test of the relationship between Performance Expectancy and Trust towards the Telemedicine Adoption scenario in Malaysia. The non-significant direct effect of performance expectancy

(H1) carries a meaningful implication that extends beyond the statistical result. For Gen Z, a cohort that has grown up with smartphones, social media, and on-demand digital services, the utility of technology is a baseline assumption rather than a differentiating factor. This implies that while Malaysia's current trusted healthcare system may reduce perceived need for trust in telemedicine platforms, it explains the non-significant direct effect of trust found in this study. However, this finding also indicates that a digital trust remains critical for data security and platform reliability.

Contrary to the results reported in the current study, few early scholars have found that the elements of trust are an important factor in the adoption of telemedicine (Alviani et al., 2023; Ekaimi et al., 2024; Kuen et al., 2023). The findings from the current study have produced a new, remarkable outcome compared with the trust-based conventional wisdom from the previous study. While prior literature consistently supports performance expectancy as an adoption driver (Alam et al., 2020; Yin et al., 2024), the present findings suggest that this relationship does

Table 4  
*Hypothesis-testing result for the mediating effect of the independent variable towards telemedicine adoption*

	Path Coefficient ( $\beta$ )	Standard Deviation	T Statistics	P Values	Decision
(H5) PE $\rightarrow$ SE $\rightarrow$ TA	0.123	0.041	3.015	0.001	Supported
(H6) PR $\rightarrow$ SE $\rightarrow$ TA	0.098	0.036	2.685	0.004	Supported
(H7) PV $\rightarrow$ SE $\rightarrow$ TA	0.050	0.030	1.673	0.047	Supported
(H8) T $\rightarrow$ SE $\rightarrow$ TA	0.093	0.034	2.749	0.003	Supported

not hold for a cohort that already assumes digital utility by default. This is not a refutation of prior evidence but a boundary condition finding. This is very consistent with the empirical research done by Garavand et al. (2024), who had stated that their likelihood of adopting telemedicine may rely more heavily on confidence in their own ability to use it, which is measured through the psychological aspect known as Self-Efficacy, which, true enough, shows influence on telemedicine adoption behaviour in urban Malaysia. This study provides a deeper analysis of the role of price in supporting the evidence from Cocosila & Turel, 2022, Klaver et al., 2021, Bakshi and Tandon, 2021, Vidal-Silva et al., 2024, and Brahmayudha and Legowo (2024) in the conclusion of the role of price value and perceived risk in influencing the higher or lower adoption of telemedicine services. Even modest indirect effects have practical significance when designing targeted adoption interventions.

The study concludes that the context of Malaysian urban-area Gen Z consumers can be explained by the element of self-efficacy. These elements were seen as further mediating the relationships among all the constructs tested and adoption. The result shows that the foundation of telemedicine adoption lies in confidence in the health care system operation (Harris et al., 2025). Liu et al. (2022), on the other hand, further showed that self-belief influenced younger consumers' acceptance of digital health services.

## CONCLUSION

Major findings from the research offer valuable guidance to multiple stakeholder groups involved in telemedicine implementation and governance. This is especially true regarding the influential factors influencing telemedicine adoption. For healthcare providers, the findings emphasised the importance of comprehensive adoption strategies that address both technological capabilities and users' psychological readiness before telemedicine adoption.

## Theoretical Implications

The study found no substantial evidence on performance expectancy and trust in the adoption of telemedicine in the Malaysian context. This startling conclusion may be due to Gen Z's current behaviour towards established digitalisation practices in the Malaysian health care system. Future studies should explore additional behavioural theory. It should include factors like social cognitive factors, habit formation, and emotional responses to promote broader adoption among urban consumers.

Theoretically, testing the mediating role of self-efficacy across diverse perception-adoption relationships among Gen Z suggests the new potential to investigate the mediating role of self-efficacy in other health technology contexts, such as mobile health applications, wearable devices, or electronic health records. Such investigations could help develop general principles for the implementation of health technologies.

## Limitations of the Study and Recommendations for Future Research

The current study did not explicitly report on cultural or religious attitudes towards digital health consultations or telemedicine services, which may influence adoption among Malaysia's diverse population. Other than that, the multigroup analysis (MGA) for gender or income was not conducted in the current study, which limits insights into potential moderating effects. Future studies should apply measurement invariance testing followed by MGA using SmartPLS or AMOS to examine whether the self-efficacy mediation pathways differ significantly by gender, income bracket, or prior telemedicine experience, which would substantially refine the prescriptive model for targeted policy interventions. Healthcare providers and digital health platform developers should design self-efficacy-enhancing onboarding experiences calibrated to Gen Z's media consumption norms. Apart from that, digital literacy might also moderate or mediate the effect of self-efficacy on adoption, which future studies need to incorporate to refine the predictive telemedicine adoption model. Including the qualitative method could also be utilised in future to uncover nuanced psychological barriers, complementing the quantitative findings and enhancing model depth. The predictive model should be extended to rural and low-income populations as well, where technological readiness and access differ significantly.

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