

# THE EFFECT OF CUSTOMER REVIEW AND TECHNOLOGICAL INNOVATION ON PERCEIVED RISK IN PARENTAL CHILDCARE DECISION-MAKING

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**Abstract:** *Parents are the decision makers in childcare selection although they are not the primary users of the service. They are responsible to carefully assess possible risk, so that the children would be under quality, safe and reliable care. This study aims to determine the effect of customer review and technological innovation on perceived risk among parents in childcare service purchase decision. The data were collected from 385 respondents from four regions (northern, southern, eastern and western) of Peninsular Malaysia, and analysed using multiple regression analysis. The results confirm that customer review does not significantly affect parents' perceived risk. In contrast, technological innovation significantly affected perceived risk. These findings imply that customer review is not an important factor to parents who make childcare decision. However, the presence of technological innovation such as online platforms that enable parents to seek childcare information and compare available services are imperative in risk-driven childcare decision-making. As a results, developing an apps or websites that catalogue childcare services would enable childcare providers to supply needed information and ease parents in making alternative evaluations and purchase decision. This study presents a novel contribution in extending current understanding of parents' behaviour as consumers in childcare service industry.*

**Keywords:** *Customer Reviews, Technological Innovation, Perceived Risk, Parental Decision-Making, Childcare Services, Consumer Behaviour*

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## Introduction

Nurturing Care Framework developed by the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and the World Bank aims to enable children to survive and thrive to transform health and human potential. This framework aligns with the Sustainable Development Goal (SDG) to ensure every child has the right to receive quality education and care. In Malaysia, childcare centres provide necessary child development activities to nurture the children's ability during early years. To achieve this objective, the Malaysian government enforces Childcare Center Act 1984 which aims to protect the safety, health, and well-being of children.

However, the Minister of Women, Family and Community Development reported 34 cases of child abuse at childcare centres between 2020 and 2024, including four deaths in 2024 alone (Junaidi et al., 2025). In 2021, 217 children were abused by caregivers throughout Malaysia (Sharifah Mahsinah Abdullah, 2022). Looking into this issue, it is imperative to understand parents' behaviour as consumer. Parents are the decision makers in childcare selection although they are not the primary users of the service. They are responsible to carefully assess possible risk, so that the children would be under quality, safe and reliable care. Parents who deliberately exposed their children to harm could be charged under the Child Act (2001) with a provision of imprisonment for up to 20 years. Therefore, parents could ensure their children's safety and avoid unnecessary punishment by understanding factors influencing parents' perceived risk (Nur Shahira Ahmad et al., 2025).

A past systematic review revealed that perceived risk is influenced by website stimulus, marketing stimulus, situational stimulus, psychographic characteristics, and demographic characteristics (Phamthi et al., 2024), which align with the current study. Customer review which falls under the situational stimulus, may affect perceived risk and purchase intention of customers positively or negatively (Phamthi et al., 2024). Similarly, technological innovation such as website, apps or social media pages which falls under the website stimulus and marketing stimulus, may affect perceived risk or not.

However, most studies on perceived risk have been conducted in the context of online shopping (Theocharis et al., 2025; Li et al., 2024; Roy & Shaikh, 2024; Yuniarti et al., 2022; Qalati et al., 2021). Instead, most childcare service purchasing involves omni-channel purchase behaviour due to perceived greater risk that could affect their children. Omni-channel purchase happens when customers use multiple online and offline channels to finalize their decision. For example, parents identify a childcare service through WhatsApp, research more information on the childcare provider's Facebook, visit the childcare facility to ascertain their choice and finally make their purchase through WhatsApp. Therefore, this study extends the current understanding about perceived risk in omni-channel purchase. Accordingly, the objective of this study is to determine the effect of customer review and technological innovation on perceived risk in omni-channel purchase context involving parents as the consumer.

## Literature Review

### Perceived Risk

Perceived risk is a subjective assessment of an individual about the likelihood and severity of an adverse events that usually results in alarming, anxious and disturbing feelings (Foster et al., 2020). It is more common for risk perceivers to analyse risk using subjective and qualitative judgement because it is convenient (Nurul Adila Idris & Norlaile Salleh Hudin, 2022). In business, perceived risk increases when customers do not understand product information (Bauer, 1960). Therefore, this study defined perceived risk as parents' concern that their children will be victimized, harmed or neglected by the childcare providers. Previous study explained that perceived risk could influence customers' decision (Phamti et al., 2024).

Similarly, perceived risk has a negative relationship with purchase intention (Vasudevan et al., 2023; Geetha et al., 2021; Nur Farah Ain Abd Shukor et al., 2024). Foster et al. (2020) categorized perceived risk into two types, i.e., secrecy risk and security risk, whereas Tham et al. (2019) categorized perceived risks into financial risk, performance risk, convenience risk, non-delivery risk

and return policy risk. On the other hands, Yang et al. (2016) measured perceived risks as financial risk, social risk, performance risk, and psychological risk. This study, however, will only adapt the financial risk and performance risk because secrecy risk, security risk, convenience risk, non-delivery risk and return policy risk focus more on online selling of products; thus, they do not fit to the nature of childcare service.

In pre-purchase stage, customers evaluate the value of the potential service benefits in exchange for the price they will pay. Perceived financial risks occur in this pre-purchase stage where customers feel uncertain whether their money is going to be well spent or not (Yang et al., 2016). If the product does not fulfil their needs in post-purchase stage, customers will develop a regret and become certain that their money has been wasted. Therefore, in this study, financial risk is defined as parents' assessment of potential financial loss when purchasing a suboptimal childcare service.

In contrast, performance risk is potential problems such as malfunctioning and reliability problems, which cause products not to perform as expected (Yang et al., 2016). It often happens when customers could not comprehend the product's quality due to unconvincing product descriptions (Tham et al., 2019). Besides, performance risk increases because customers can only estimate the functionality of the product based on limited experience before purchasing the product (Lee at al., 2022). Accordingly, this study defined performance risk as parents' assessment of uncertainty that a childcare provider not delivering expected quality service.

### Customer Review

Parents who have never used childcare services often take a long time to choose a childcare that suits their needs. Typically, they rely on friends', neighbours and families' recommendations to identify suitable childcare (Pacheco-Applegate et al., 2020; Herbst et al., 2020). By depending on friends', neighbours' and families' recommendations, it also means that parents' have limited their options only to childcare patronized by the friends and families although they may have different preferences towards childcare. For example, Davidson et al. (2022) identified five types of parents who have varying understanding and preference for childcare services. Therefore, to find the best childcare, parents should be offered with as much information about all available childcare in the neighbourhood (Pilarz et al., 2022) and this can be done by

empowering other parents (not only friends and families) to share their honest reviews with others.

Moreover, since Childcare Centre Act 1984 stated that only Director General of DSW and authorized officers are allowed to enter childcare premises, parents who never used childcare services do not have direct access to inspect health and safety practices at the childcare centres (White et al., 2018). As a result, parents could not confirm whether a childcare centre complies with basic health and safety standards (Davidson et al., 2022; White et al., 2018). Without accurate information, parents take a risk when sending their children to be cared for.

Although the childcare registration status can be confirmed by checking the DSW website, parents still could not confirm the quality of other childcare characteristics such as caregiver-child interaction and childcare responsiveness to parents because such information are beyond the Childcare Centre Act 1984 monitoring scope. Similarly, Pacheco-Applegate et al. (2020) found that childcare decision-making process is often impeded by the scarcity of information on the availability, cost, or quality of childcare options. Apparently, the fastest and most accurate way to reduce pre-purchase uncertainty is by learning from other parents' generated reviews.

According to Praharjo and Kusumawati (2016), one of the most effective ways to lower customers' perceived risk is through online customer surveys, which provide advice from the online community. Other customers reviews are as good as the traditional word-of-mouth in reducing perceived risk and building customers' trust towards the retailers (Liu et al., 2019). Moreover, people feel more comfortable with choices also supported by others (Bu et al., 2021). Hence, this study hypothesizes that customer review has a significant effect on perceived risk.

H1: Customer review has a significant effect on perceived risk

### **Technological Innovation**

Besides friends, neighbours and families, Malaysian parents typically make childcare search by browsing childcare advertisements on social media sites such as Facebook, WeChat and Instagram (Anor et al., 2019). The internet was widely used as an additional source, including general websites about childcare providers, a specific provider's own website, and Ofsted reviews of local nurseries (Mollidor et al, 2022). Parents search for childcare using these social media sites because childcare recommended by their friends, neighbours and families do not demonstrate acceptable risk or simply because they want to be certain that they make the best choice among many childcare options that pose different level of risks. Therefore, this study argues that technological innovation (e.g., webpage, social media sites and mobile apps) could assist parents in selecting childcare that would least likely to cause any harm on their children.

Previous studies investigating product purchasing risk indicate that customers return to word of mouth, major brand image, and website reputation to reduce perceived risk (Cheng et al., 2013). By weighing the negative consequences of buying a given product based on multiple information, customers can lower the risk of making an incorrect decision. In childcare decision, parents who can be regarded as the customers, also adopted several risk reduction strategies especially by comparing information from different sources. However, child injuries and deaths in the centre's care indicate that the information parents need to make proper childcare decision is incomplete or difficult to access. The information that they use to make childcare decision could be misleading and failed to create high perceived risk among parents.

Hence, technological innovation is critical to ensure that valid and complete information is available to parents. Accordingly, the following hypothesis is proposed.

H2: Technological innovation has a significant effect on perceived risk.

## Methodology

### Sample

This study was conducted in four regions of Peninsular Malaysia namely the northern, southern, eastern and western regions. The Peninsular Malaysia was selected as the study location because most child abuse and neglect cases reported in news happened in Peninsular Malaysia compared to the East Malaysia (Sabah, Sarawak and Federal Territory of Labuan). Moreover, an exhaustive list of childcare users from each region in Peninsular Malaysia is not available based on the researchers' investigation. Therefore, the sampling procedure for this study was conducted according to the marriage statistics in 2022. The Department of Statistics (2022) reported a total of 183,947 marriages in these four regions as shown in Table 1. Hence, the minimum sample size for this study is 384 (Krejcie & Morgan, 1970). The samples, who were the mothers from each marriage, were selected using quota sampling.

**Table 1: Sample size based on DOSM (2022) marriage statistics**

Region	Population	Proportion	Sample Size
Northern <i>Perlis, Kedah, Pulau Pinang and Perak</i>	44,901	24%	94
Central <i>Selangor, Federal Territory of Kuala Lumpur and Putrajaya</i>	54,220	29%	113
Southern <i>Negeri Sembilan, Melaka and Johor</i>	40,878	22%	85
Eastern <i>Kelantan, Terengganu and Pahang</i>	43,948	24%	92
Total	183,947	100%	384

### Research Instrument

This study used a questionnaire for data collection. The questionnaire contained three parts; customer review, technological innovation and perceived risk. Initially, there were 47 items which were anchored on a 5-point Likert scale (1-strongly disagree to 5-strongly agree). The questionnaire was sent to be validated by six experts with business and early childhood background. Through the content validity procedure, four items from customer review construct and 17 items from technological innovation were removed. The content validity index (CVI) for the questionnaire exceeded the minimum I-CVI, i.e., 0.78 for 6 experts (Lynn, 1986), and Davis (1992) and the minimum S-CVI, i.e., 0.80 (Davis, 1992; Grant & Davis, 1997; Polit & Beck, 2004).

This study gathered 180 responses during the pilot study to test the reliability of the questionnaire. The Cronbach alpha obtained for customer review, technological innovation and perceived risk were 0.953, 0.952 and 0.933 respectively. Based on Saunders et al. (2019), the reliability of an instrument is established when the minimum Cronbach alpha (0.70) is obtained. Therefore, the current instrument is reliable for data collection. Table 2 summarizes the instrument of this study which contain 26 items.



**Table 2: Research instrument**

Domain	Constructs	Source(s)	Number of items	Total items
Customer review	Review usefulness	Chatterjee et al. (2022) & Filieri et al. (2020)	8	15
	Argument quality	Xiao & Lee (2019)	4	
	Perceived quantity of reviews	Xiao & Lee (2019)	3	
Technology innovation	Visual appearance	Sohaib & Kang (2015)	5	5
Perceived risk	Financial risk	Yang et al. (2016)	3	6
	Performance risk	Yang et al. (2016)	3	
TOTAL				26

### Data Collection and Data Analysis

Data were collected from mothers, the customers of childcare providers. Self-administered questionnaires were distributed through social media platforms to allow convenient access to the respondents. Data collection was conducted from May until July 2024. The first part of the questionnaire states the objectives of the study, respondents' confidentiality and anonymity statement, consent to participate in the survey and respondents' withdrawal statement from the study. The respondents spent about 10-15 minutes to complete the questionnaires. Data collection was ended when the minimum sample size is achieved.

### Findings and Discussion

385 responses were obtained and analysed using descriptive analysis. Table 3 shows that most respondents are bachelor degree holders (56.1%,  $n=216$ ). Meanwhile, 22.1% ( $n=85$ ) of them are Diploma holders. This study also found that the monthly household income of most respondents is RM3000 to RM3999 (43.9%,  $n=169$ ), whereas 26.2% ( $n=101$ ) are in the lower income bracket, i.e., RM2000 to RM2999 per month (see Table 4). However, 23.4% ( $n=90$ ) of the respondents belong to a higher income bracket that is more than RM4000 per month. Based on Table 5, the majority of the respondents utilized childcare services for 1 to 2 years (65.5%,  $n=252$ ). Moreover, 20.3% ( $n=78$ ) utilized childcare services for less than a year. Only 55 mothers (14.3%) used childcare services for more than 3 years. On regards to the types of childcares previously utilized by the respondents, most of them (97.7%,  $n=376$ ) sent their children to unregistered childcare services. Registered childcare are services that were registered under the Department of Social Welfare, an agency overseen by the Ministry of Women, Family and Community Development. Registered childcare is often attributed to higher safety and quality service standards.

**Table 3: Respondents' profiles – education level**

Education Level	Frequency	Percentage
Primary education	1	0.3%
Secondary education	3	0.8%
Certificate	36	9.4%
Diploma	85	22.1%
Bachelor degree	216	56.1%
Master degree	34	8.8%
Ph.D	10	2.6%
	385	100.0%

**Table 4: Respondents' profiles – household incomes**

Monthly Household Income	Frequency	Percentage
Below RM 1000	7	1.8%
RM 1000-RM 1999	18	4.7%
RM 2000-RM 2999	101	26.2%
RM 3000-RM 3999	169	43.9%
RM 4000 and above	90	23.4%
	385	100.0%

**Table 5: Respondents' profiles – number of years utilizing childcare services**

Years	Frequency	Percentage
Less than one year	78	20.3%
1-2 years	252	65.5%
3-5 years	51	13.2%
6-10 years	3	0.8%
More than 10 years	1	0.3%
	385	100.0%

**Table 6. Types of Childcares Utilized**

Types of Childcares	Frequency	Percentage
Unregistered	376	97.7%
Registered	9	2.3%
	385	100.0%

Table 7 verified that the model which test the effect of customer review and technological innovation on perceived risk is significant ( $p < 0.001$ ,  $\alpha = 0.05$ ). However, only 9.14% of the total variation in perceived risk could be explained by customer review and technological innovation. It means that there are other more important variables which have not been included in this study contributing to perceived risk of parents, who are the decision makers in childcare selection.

**Table 7: Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
1	0.310	0.0962	0.0914	20.3	2	382	<.001

Note. Models estimated using sample size of N=385

**Table 8: Multiple Regression Results**

Predictor	Estimate	SE	t	p
Intercept	9.645	0.732	13.18	<.001
Technological Innovation	-0.568	0.113	-5.04	<.001
Customer Review	-0.164	0.107	-1.54	0.125

Note: Dependent variable: Perceived risk

Furthermore, the multiple regression analysis results depicted in Table 8 confirmed that technological innovation has a significant negative effect on perceived risk ( $\beta = -0.568$ ,  $\alpha = 0.05$ ). Therefore, this finding indicates that good technological innovation lower parents' negative feelings about childcare services. Childcare service providers in Malaysia often advertise their services in social media platforms such as Facebook and Whatsapp. The advertisement typically contains images of children learning and playing activities besides the facilities of the centres. According to Liu and Guo (2019), image colour has the most effect on customer choice. Moreover, purchase decision has been significantly affected by creative use of colours, which help create the right mood to convince customers to purchase (Levy & Weitz, 2019; Wahyu et al., 2017). Given that context, Malaysian parents are possibly inclined to be visual customers who paid more attention on images presented by childcare providers in making childcare decisions.

However, this study also found a non-significant effect of customer review on perceived risk ( $\beta = -0.164$ ,  $\alpha = 0.05$ ). It happened probably because parents still feel that other parents' reviews may not be relevant to their personal needs because every child has different needs and preferences. In addition, parents could also feel that other parents who are laymen developed risk perception based on subjective assessment (Paek & Hove, 2017), leading to unstandardized risk assessment. In childcare context, a childcare considered safe by a parent may not be perceived as safe by other parents; hence, other parents' reviews are regarded as not important. Some people also have optimism bias (Hogan et al., 2018) and fatalistic belief (Ngueutsa & Kouabenan, 2017) that could possibly distort risk perceptions. On a different note, there could be an effect of another variable not included in this relationship, causing this insignificant relationship.

### Conclusion and Recommendation

This study aims to determine the effect of customer review and technological innovation on perceived risk among parents in childcare service purchase decision. Based on the data collected from 385 Malaysian parents, this study revealed that technological innovation significantly affected perceived risk, while customer review did not. The findings imply that customer review is not an important factor to parents who make childcare decision. However, the presence of technological innovation such as online platforms that enable parents to seek childcare information and compare available services are imperative in risk-driven childcare decision-making.

As a recommendation, this study believes the relevant ministry should develop apps or websites to ease parents in making alternative evaluations and purchase decision. Furthermore, parents need to be educated that they should consider more meaningful information instead of depending on images *per se* to make a childcare decision. Despite that, the childcare providers



could leverage on the behaviour of Malaysian parents in making purchase decision based on colour and images.

This study contains several limitations. Although the minimum sample size was achieved, the findings could not be simply generalized due to the quota sampling technique used. As a result, almost all respondents in this study comprised parents who used unregistered childcare services; thus, there is a minimum insight on how registered childcare users' perceived risk is shaped. However, this study successfully presents a novel contribution in extending current understanding of parents' behaviour as consumers in childcare service industry with respect to perceived risk as a proxy to purchase decision-making.

Future researchers could test the technological innovation as the mediator in the relationship between customer review and perceived risk to gain deeper understanding of the insignificant effect of customer review on perceived risk confirmed by this study. In addition, more variables such as interactivity between parents and childcare providers could be included in the model to cater the unexplained variation in the perceived risk.

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