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Empowering the autism guardian: assessing the usefulness of digital content

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ABSTRACT

This study adopts a quantitative cross-sectional research design to examine the perceived usefulness of digital content in supporting guardians of children with autism. Data were collected from 150 caregivers in the Klang Valley region using a questionnaire adapted from the usefulness, satisfaction, and ease of use (USE) questionnaire. The instrument was validated by a panel of five experts to ensure clarity, relevance, and alignment with the research objectives. Data analysis included tests of normality, Pearson correlation, and simple linear regression (SLR). The results reveal a strong positive relationship between perceived usefulness and user satisfaction ($r=0.845$, $p<0.001$), with regression analysis indicating that perceived usefulness significantly predicts satisfaction **(**$R^2=0.714$**)**. These findings demonstrate that higher perceived usefulness of digital content is associated with greater satisfaction among autism guardians. This study contributes by providing empirical evidence on the importance of usability-driven digital interventions and offers a validated measurement framework to guide the design of effective, user-centered digital support tools for autism caregivers.

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1. INTRODUCTION

The diagnosis of autism spectrum disorder (ASD) is a life-altering experience that affects both individuals and their families. Guardians of children with autism often face continuous challenges related to social interaction difficulties, behavioral management, and developmental support, which can be emotionally demanding and complex to manage [1], [2]. As primary caregivers, they are required to seek appropriate resources and strategies to effectively support their children's needs.

Digital content has increasingly become an important medium for delivering information and support in healthcare and educational contexts [3], [4]. In the domain of autism, such content offers various forms of assistance including educational materials, communication tools, and support networks [5]–[8]. These resources provide advantages such as accessibility, flexibility, and continuous availability, enabling guardians to access guidance and support at any time. However, existing studies have largely focused on the effectiveness of digital interventions for children with autism, with limited attention given to the experiences and needs of guardians as primary users [5]. This indicates a critical research gap, as the effectiveness of these digital tools depends on how well guardians can adopt and utilize them in real caregiving situations.

Furthermore, although digital content tailored for autism guardians such as mobile applications, websites, online communities, and interactive learning tools has been widely developed [9], there is still insufficient empirical evidence regarding its perceived usefulness and its impact on user satisfaction. Many studies emphasize system functionality or intervention outcomes but do not evaluate how guardians perceive the value of these tools in supporting their caregiving roles. As a result, it remains unclear whether existing digital resources adequately meet the practical and emotional needs of this user group.

In recent years, digital platforms have expanded to include interactive tutorials, video modelling, and downloadable resources that assist guardians in improving communication, managing behavioral challenges, and promoting independence among children with autism [10]–[12]. While these developments demonstrate the potential of digital support systems, a deeper understanding of user perception is necessary to determine their effectiveness in real-world contexts.

To address this gap, this study adopts the technology acceptance model (TAM) as the theoretical framework. TAM suggests that technology adoption is primarily influenced by perceived usefulness, which subsequently affects user satisfaction and acceptance [13]. In this study, perceived usefulness refers to the extent to which guardians believe that digital content enhances their caregiving effectiveness, while user satisfaction reflects their overall experience when using these resources. This framework provides a structured approach to evaluating digital content from a user centered perspective [14].

Therefore, this study aims to evaluate the usefulness of digital content in empowering autism guardians by examining the relationship between perceived usefulness and user satisfaction. By focusing on guardians as end users and applying a theory-driven approach, this research contributes to bridging the gap between digital resource development and the actual needs of caregivers, ultimately supporting the design of more effective digital interventions [15], [16]. In addition, this study provides empirical insights into optimizing digital content for autism guardians by identifying key factors that influence the effectiveness and acceptance of digital interventions. These findings contribute to technology adoption research in healthcare and inform the design of more user centered digital solutions for autism support.

2. BACKGROUND STUDY

Individuals with ASDs experience persistent challenges in communication, social interaction, and sensory processing, which significantly affect their daily functioning and necessitate continuous support from caregivers, commonly referred to as autism guardians [17], [18]. While existing studies acknowledge the critical role of these guardians in providing care, education, and advocacy, the current body of digital resources such as websites, blogs, forums, and mobile applications remains largely oriented toward individuals with ASD rather than their caregivers [12]. This imbalance reveals a fundamental misalignment between resource design and user needs. Although such platforms offer general information and community support, they often lack personalization and practical applicability for guardians, thereby limiting their effectiveness in addressing real caregiving challenges [5].

Recent literature has explored the use of multimedia, particularly film and video, as tools for enhancing understanding of complex conditions such as ASD [19], [20]. These studies suggest that visual-based approaches can improve comprehension and engagement, especially when addressing diverse learning preferences among caregivers [21]. However, while these findings highlight the pedagogical potential of multimedia, they remain largely conceptual and do not sufficiently evaluate how such approaches translate into structured digital parenting resources. In contrast, Besler and Kurt [22] provide empirical evidence demonstrating that video modelling can be effectively implemented by parents with high treatment fidelity, leading to improved child outcomes and skill generalization. This indicates a shift from passive information consumption toward actionable, skills-based digital interventions. Nevertheless, the integration of such evidence-based strategies into widely accessible digital platforms remains underexplored.

Despite growing recognition of the benefits of digital interventions for individuals with ASD [23], there is a notable lack of research specifically examining their usefulness from the perspective of autism guardians [24], [25]. Existing studies tend to generalize the effectiveness of digital tools without critically assessing their relevance, usability, or impact on caregivers' decision-making and caregiving efficacy. This gap is further reinforced by Gatos and Yantaç [26], who emphasize the scarcity of digital resources tailored to the unique responsibilities and emotional demands faced by parents of children with autism. Importantly, while prior work highlights the need for supportive tools, it often stops short of systematically evaluating their effectiveness or aligning them with established usability and acceptance frameworks.

A synthesis of the literature reveals a clear research gap, as despite the potential of multimedia-based and digital interventions, there remains insufficient empirical investigation into how and to what extent such content is useful and satisfying for autism guardians. Therefore, this study addresses this gap by focusing on the evaluation of digital content specifically designed for caregivers, with particular emphasis on

its perceived usefulness and impact on user satisfaction. By doing so, it extends existing literature beyond descriptive accounts and provides a more targeted and evidence-based understanding of usability-driven digital support for autism caregiving.

3. METHOD

This study adopted a quantitative research design to investigate the perceived usefulness of digital content in supporting and empowering guardians of children with autism. The quantitative approach was selected because it provides an objective means of measuring users' perceptions and examining relationships among the study variables. Data were primarily collected through a structured questionnaire administered to autism guardians. In addition, preliminary interviews with selected caregivers and subject matter experts were conducted during the instrument development stage to obtain contextual insights and ensure the relevance of the questionnaire items. The collected data were analyzed using descriptive and inferential statistical techniques to evaluate the perceived usefulness of the digital content, examine its relationship with user satisfaction, and determine its predictive influence on user satisfaction.

3.1. Research design

The development of a home-based video guide for parents of autistic children has become increasingly significant in recent years. Such a resource holds promise for closing the gap between professional expertise and the everyday challenges faced by families living with autism. By providing parents with practical strategies, evidence-based techniques, and real-life examples, these guides can empower them to take an active role in their child's learning and development. This study aims to evaluate the perceived usefulness of a home-based video guide in empowering parents or guardians to support and guide their autistic child's daily routines. Specifically, the research will assess how well the digital content equips parents to confidently apply these strategies in their home environment, fostering greater involvement in their child's growth and daily activities.

Utilizing a cross-sectional research design will allow for the collection of data at a specific point in time, providing valuable insights into the current perspectives and experiences of autism guardians regarding digital content tailored to meet their unique needs. By distributing questionnaires, this research study aims to capture a diverse range of opinions and experiences from autism guardians, offering a comprehensive understanding of the impact and effectiveness of digital resources in empowering and supporting this community. This research investigated the relationship among two constructs which are user satisfaction and usefulness of the digital content.

3.2. Questionnaire instrument

The data collection process employed a questionnaire adapted from the usefulness, satisfaction, and ease of use (USE) questionnaire, originally developed by Lund [27] and subsequently evaluated for reliability and validity by Gao *et al.* [28]. The instrument has been widely applied in usability and user experience studies to measure key dimensions such as usefulness, ease of use, ease of learning, and satisfaction. The adoption of this established instrument enhanced the credibility and consistency of the data collection process, thereby improving the overall quality of the study.

The USE questionnaire consists of 30 items designed to assess four usability dimensions: usefulness, ease of use, ease of learning, and satisfaction [27], [29], [30]. It has been widely utilized in evaluating digital products and services to identify strengths and areas requiring improvement from the users' perspective [31], [32]. For the purpose of this study, only the usefulness and satisfaction constructs were adapted, as presented in Table 1. Responses were measured using a five-point Likert scale, where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Table 1. Adapted questions from the usefulness and satisfaction sections of the USE questionnaire [27]

No	Adapted instrument for usefulness	Adapted instrument for satisfaction
1	This video helps me become more effective	I am satisfied with this video.
2	This video helps me be more productive	I will recommend this video to my friends and acquaintances.
3	This video is useful and can benefit me.	This video is easy to understand and interesting to watch.
4	This video allows me to help with my child's daily activities.	This video is very good as a reference.
5	This video makes the task that I want to do become easier.	I would like to have this video for future references.
6	This video saves me time.	The use of this video is pleasant and does not have any negative implication.
7	This video is exactly what I expected.	

The instruments were validated by a panel of five experts, including specialists in multimedia content and psychology. Their expertise ensured that the questionnaire was clear, concise, and aligned with the research objectives. Through their review, any potential ambiguities or inconsistencies were addressed, enhancing the questionnaire's effectiveness in gathering relevant data. By involving experts in the validation process, the research ensured the quality and relevance of the instruments used for data collection.

3.3. Respondents and data collection

Data were collected from caregivers of children with ASD residing in the Klang Valley region of Malaysia. The questionnaire was distributed through online platforms, autism support groups, autism-related organizations, social media channels, and face-to-face sessions. Data collection was conducted over a three-month period from January 2024 to March 2024. A total of 150 complete and valid responses were obtained and included in the final analysis.

3.3.1. Sampling method and respondent criteria

A purposive sampling technique was employed to recruit respondents who met the study requirements. The target population consisted of parents and primary caregivers responsible for the daily care of children diagnosed with ASD. To be eligible for participation, respondents were required to be at least 18 years old, be a parent or primary caregiver of a child with ASD and have viewed the video-based digital parenting content prior to completing the questionnaire. Responses with incomplete questionnaire data were excluded from the analysis. This sampling approach ensured that only individuals with direct experience and relevant knowledge of the digital parenting content were included in the study.

3.4. Data analysis

The data analysis processes conducted involved several key steps. First, the collected data underwent a thorough data cleaning process to ensure accuracy and consistency. Subsequently, the data was classified into two distinct categories: usefulness scales and satisfaction scales. In this study, the USE questionnaire consists of two key sections: the satisfaction section which has 6 items, and the usefulness section with 7 items. Reliability statistics were then calculated using Cronbach's alpha values to assess the internal consistency of the data. A high Cronbach's alpha values indicate that response values for each participant across a set of items are consistent. Each participant's responses were rated on a Likert scale from 1 to 5, and the mean score for each section was calculated by summing the scores and divided by the number of items. The mean scores reveal the average levels of satisfaction and perceived usefulness among participants, highlighting their overall rating on the usefulness and satisfaction on the digital content.

Data analysis was performed using IBM SPSS Statistics Version 29. Descriptive statistics were used to summarize participants' responses and determine the levels of perceived usefulness and satisfaction. Reliability analysis was conducted using Cronbach's alpha to assess internal consistency. Pearson correlation analysis was employed to examine the relationship between perceived usefulness and user satisfaction, while simple linear regression (SLR) analysis was performed to determine the predictive influence of perceived usefulness on user satisfaction. Statistical significance was evaluated at the 0.05 level.

3.5. Ethical considerations

Maintaining ethical standards in research is essential to protecting participants' rights and welfare. To ensure that research study ethics are upheld, the following procedures have been put in place: researchers need to have participants' informed consent before starting the survey. It is crucial that researchers outline the goal of the study, the steps required, and possible risks or advantages before beginning any data collecting. It is important for participants to know that the research is entirely voluntary and that they can leave at any time without facing any repercussions.

In addition, ensure anonymity and confidentiality of responses to encourage honest feedback: participants' responses should be kept confidential and anonymized to protect their privacy. Data should be securely stored and accessible only to authorized personnel. By assuring participants that their responses will not be linked back to them, researchers can promote honest and candid feedback.

Lastly, it was to comply with ethical guidelines and regulations related to research involving human subjects: researchers had to adhere to established ethical guidelines and regulations governing research involving human subjects, researchers had obtained approval from UiTM's Institutional Review Board (IRB) and Ethics Committee (REC/07/2022 (PG/MR/141)). Compliance with these guidelines ensures that the research was conducted ethically and with respect for participants' rights and welfare.

4. RESULTS

The research study aimed to evaluate the usefulness of digital parenting resources designed for caregivers of children with autism. Survey responses from 150 participants were analyzed to assess the reliability of the measurement constructs and to examine the relationship between perceived usefulness and user satisfaction. The findings provide empirical evidence regarding the perceived usefulness of video-based digital content support tool for autism guardians.

Internal consistency reliability was examined using Cronbach's alpha. For the 7-item usefulness scale, Cronbach's alpha was excellent at 0.959, indicating high agreement between responses. The 6-item satisfaction scale also demonstrated very good reliability with a Cronbach's alpha of 0.940. Generally, values closer to 1 represent greater consistency between responses. Using multiple survey items to measure each construct enhances reliability, as shown in Table 2.

In addition, the mean scores on research survey Likert scale had been converting to a 0−100 scale to put the values in a more tangible percentage. For usefulness, the mean score on the 5-point Likert scale was 4.400, indicating a strong consensus among participants about the effectiveness of the evaluated materials. In percentage terms, this equates to a score of 88.00 out of 100, demonstrating that participants found the digital content to be highly useful, as seen in Table 3.

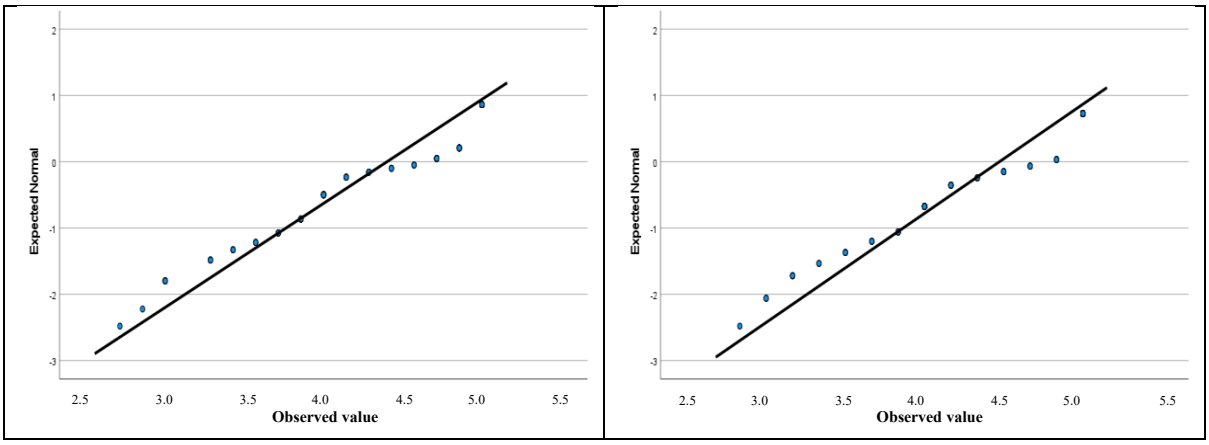
Table 2. Reliability statistics

Variables	Cronbach's alpha	N of items
Usefulness	0.959	7
Satisfaction	0.940	6

Table 3. Mean score and 0−100 score

Variables	Mean score	0−100 score
Usefulness	4.400	88.00
Satisfaction	4.472	89.45

Similarly, the mean satisfaction rating was 4.472, which corresponds to 89.45 out of 100. This suggests participants expressed a high level of satisfaction with the evaluated items. Overall, the analysis showed that participants generally agreed or reported high levels of usefulness and satisfaction associated with the evaluated materials. These findings provide support for the effectiveness of the video-based parenting program as perceived by the study participants. The high mean scores for both usefulness and satisfaction underscore how well-received the program was and its potential to meaningfully support parents of children with autism. Upon conducting an initial analysis of the data distribution, a critical step in determining the appropriate statistical methods for further analysis, the normality of the data was assessed using Q-Q plots for both usefulness and satisfaction. Figures 1(a) and (b) illustrate that the data points closely conformed to the straight line, suggesting that the distributions of both satisfaction and usefulness were approximately normal.



(a) (b)

Figure 1. Q-Q plot for usefulness (a) Q-Q plot for satisfaction and (b) were approximately normal

The study used a Pearson correlation analysis to examine how participants' ratings of a video-based parenting program's usefulness related to their satisfaction. The results of the two-tailed test, which was set at a significance level of $\alpha=0.05$, showed a significantly strong positive correlation between usefulness and satisfaction ($r=0.845$, $p<0.001$). Since the p-value was less than α, the null hypothesis was rejected. This correlation is illustrated in Figure 2, which is a scatter plot where each data point represents an individual participant's ratings. Usefulness is plotted on the x-axis and satisfaction on the y-axis.

In Figure 3, a clear upward trend is evident. It indicates that as participants rated the digital content as more useful, their reported satisfaction also tended to increase. Put simply, higher perceived usefulness was significantly associated with greater satisfaction. This finding provides evidence of a positive connection between usefulness and satisfaction when evaluating this video-based parenting intervention.

A SLR was performed to investigate the relationship between usefulness and satisfaction, while ensuring that the classical assumptions of SLR were satisfied. The analysis verified that the residuals showed constant variance and independence. This was evident from the scatter plot of residuals (Figure 3), which displayed a random distribution with no noticeable pattern.

The assumption of normality was validated using the P-P plot, as shown in Figure 4, where the residuals aligned closely with the expected normal distribution. Since the model involved only one independent variable, multicollinearity was inherently absent. These confirmations provide a solid foundation for the interpretation of the regression results.

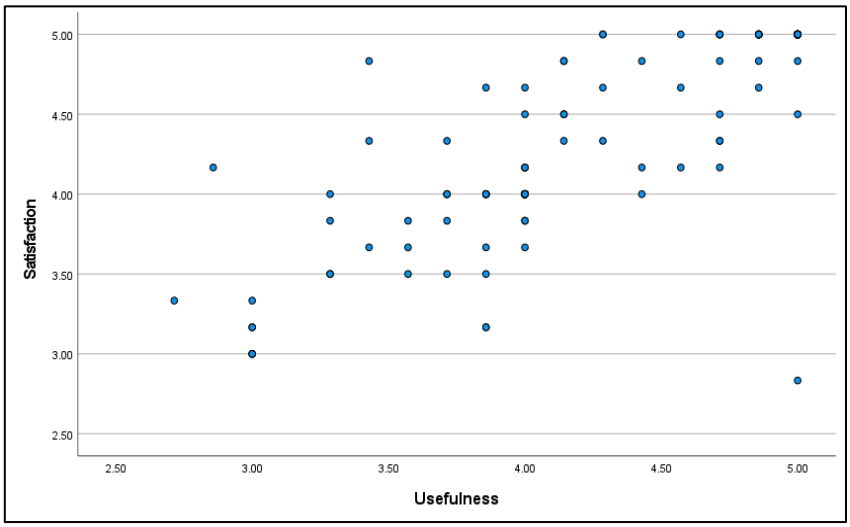


Figure 2. Scatter plot of satisfaction and usefulness

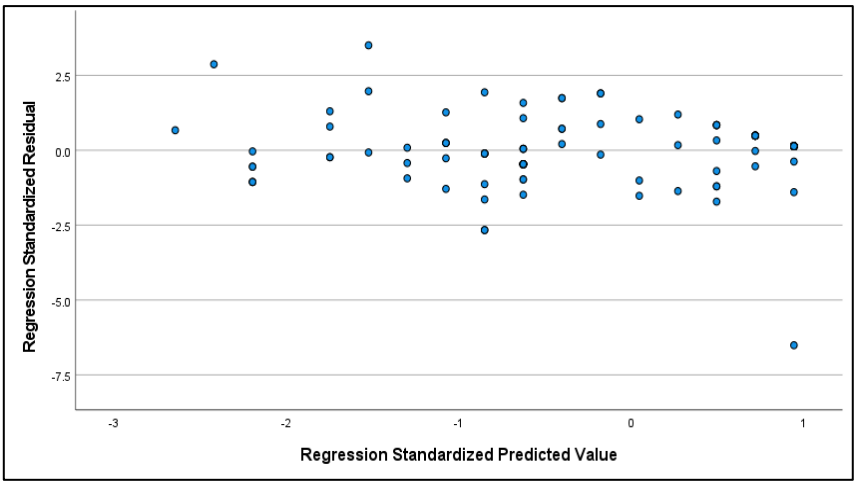


Figure 3. Scatter plot of residuals vs predicted value

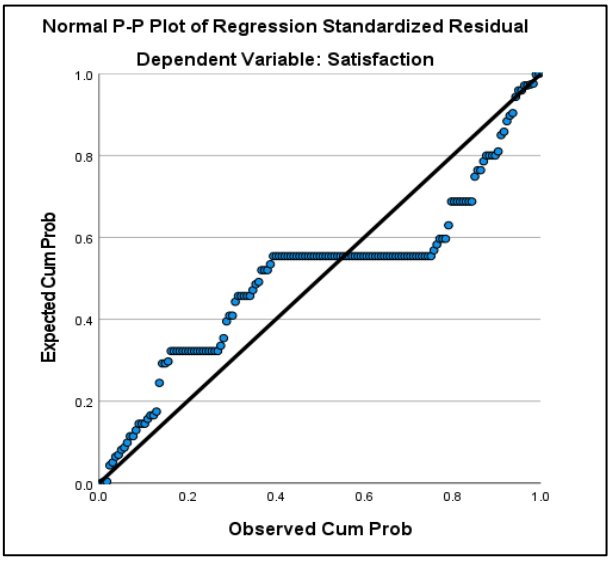


Figure 4. P-P plot of residuals

The results revealed that the regression model was highly significant, with a p-value of less than 0.001. The R-squared value of 0.714 indicates that 71.4% of the variance in satisfaction can be explained by the variation in perceived usefulness. This R-squared value highlights the robust relationship between the two variables, suggesting that as perceived usefulness increases, overall satisfaction is likely to increase as well. These findings offer compelling evidence of a positive, substantial link between usefulness and satisfaction within the context of this video-based parenting program.

5. DISCUSSION

The findings indicate that the video-based digital parenting content was perceived as both useful and satisfactory by caregivers of children with autism. Participants reported high levels of perceived usefulness and satisfaction, suggesting that the digital content effectively supported their caregiving responsibilities by providing practical knowledge and accessible guidance. These findings are consistent with previous studies reporting that digital interventions can improve caregiver engagement, increase access to information, and provide continuous support for families of children with autism [22], [24], [33]. The results therefore reinforce the growing importance of user-centered digital resources in supporting autism caregivers.

The excellent reliability values obtained for both the usefulness (Cronbach's alpha=0.959) and satisfaction (Cronbach's alpha=0.940) constructs demonstrate that the adapted USE questionnaire consistently measured the intended variables. These findings are consistent with Lund [27], who introduced the USE questionnaire, and Gao *et al.* [28], who confirmed its reliability and validity across various usability evaluations. Furthermore, the results support the usability principles outlined in ISO 9241-11 [30], indicating that the instrument is appropriate for assessing digital support systems within healthcare and educational environments.

A key finding of this study is the strong positive relationship between perceived usefulness and user satisfaction ($r=0.845$, $p<0.001$). This finding is further supported by the regression analysis, which showed that perceived usefulness explained 71.4% of the variance in user satisfaction ($R^2=0.714$). These results are consistent with the TAM, which identifies perceived usefulness as one of the strongest determinants of user acceptance and satisfaction [13], [14]. Similar findings have also been reported in studies involving online learning, mobile learning, and digital services, where technologies perceived as useful consistently result in higher levels of satisfaction and continued use [13], [14], [31]. Within the context of autism caregiving, the findings suggest that improving the practical usefulness of digital parenting resources is likely to enhance caregivers' satisfaction and encourage sustained engagement with digital support technologies.

This study also extends previous autism research by focusing on caregivers rather than solely on interventions for children with autism. While earlier studies primarily evaluated digital technologies for improving children's communication, behavioral, and daily living skills [10], [12], the present study demonstrates that caregivers' perceptions of usefulness play a critical role in determining their satisfaction with digital parenting resources. These findings highlight the importance of adopting user-centered design principles that emphasize relevance, accessibility, and practical applicability when developing digital

resources for autism caregivers. Overall, this study contributes to the growing body of literature on digital support for autism caregivers by providing empirical evidence that perceived usefulness is a significant predictor of user satisfaction. By applying the TAM within the context of autism caregiving, this study extends the application of TAM to an underexplored domain and offers practical guidance for researchers, healthcare practitioners, educators, and system developers in designing effective, evidence-based digital parenting interventions.

6. CONCLUSION

This study evaluated the perceived usefulness of video-based digital content designed to support autism guardians and examined its relationship with user satisfaction. The findings revealed high levels of perceived usefulness and satisfaction, with perceived usefulness showing a strong positive relationship with user satisfaction and significantly predicting user satisfaction. These results indicate that digital parenting resources perceived as useful are more likely to be positively accepted by caregivers. The study contributes to the existing literature by providing empirical evidence on the role of perceived usefulness in supporting user satisfaction among autism guardians. By applying the TAM, this research extends current understanding of technology acceptance in autism caregiving and offers practical guidance for developing user-centered digital parenting resources that better address caregivers' informational and support needs. This study has several limitations, including the use of purposive sampling, data collection from a single geographical region, and a cross-sectional design based on self-reported responses, which may limit the generalizability of the findings. Future research should include more diverse populations, adopt longitudinal or experimental designs, and investigate additional factors influencing technology acceptance and long-term engagement with digital support resources for autism caregivers.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest.

DATA AVAILABILITY

The data of this research are available upon request from the corresponding author, [NMD].

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