



# “Smart parenting: Effortless routine engagement with AI support: A quantitative study”

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## Abstract

The integration of artificial intelligence (AI) into parenting practices has gained significant attention, but there is limited understanding of how demographic factors influence the engagement and perceptions of AI-assisted parenting. This study aims to address this gap by examining the demographic profile of individuals engaging in AI-assisted parenting practices and exploring their perceptions of this new trend. A cross-sectional survey was conducted among Palestinian parents to collect data on demographic variables such as gender, faculty affiliation, educational background, academic title, age distribution, and number of children. Data analysis was conducted using descriptive statistics, t tests, and multiple regression analysis. The results showed that participants were significantly more engaged in AI-assisted parenting, but their perceptions of AI-assisted parenting were moderate. Interestingly, neither their involvement in AI-assisted parenting nor their perceptions were significantly impacted by most of the demographic characteristics examined. However, age and academic affiliation were significant variables, especially for the younger population and those affiliated with scientific faculties. This study provides valuable insights into the demographic characteristics of individuals engaging in AI-assisted parenting practices in Palestine and underscores the importance of considering demographic factors in understanding and promoting AI adoption. The study suggested that integrating AI-assisted parenting practices into educational programs can promote the inclusive adoption of AI technologies. This finding emphasizes the need for user-friendly and culturally sensitive AI tools, ensuring broader acceptance and utilization of AI-assisted parenting practices.

**Keywords** Artificial intelligence · AI-assisted parenting · Digital literacy · Educational support

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## 1 Introduction

Artificial intelligence is a field of computer science centered on the development of smart machines that can impersonate human behavior, reason, learn, analyze, and make decisions (Yunike et al., 2023). The term AI covers a wide range of technologies; it entails creating computer systems that are capable of performing tasks that typically call for human intelligence (Ito et al., 2023). These tasks are crucial and require a considerable set of skills, including the ability to comprehend natural language, identify patterns, make sound judgments, and acquire knowledge by learning from mistakes (Montgomery, 2023). The integration of artificial intelligence (AI) into our daily lives has led to a transformative wave of innovation and convenience, particularly in the realm of parenting (Yu, Chenke & Roque, 2020). AI offers an innovative solution for routine administration tailored to the fast-paced and demanding nature of contemporary living (Davidoff et al., 2006). This shift, known as “smart parenting,” envisions a future where technology becomes an indispensable assistant, simplifying the complexities of child-rearing and fostering a more tranquil home atmosphere (Livingstone & Blum-Ross, 2020; Virani et al., 2019).

Smart parenting is centered around the idea of making parenting both easier and more efficient through the strategic utilization of AI technology (Virani et al., 2019). By harnessing the power of AI-driven solutions, parents can more effectively navigate their responsibilities, including managing schedules, providing personalized educational support, ensuring safety, and monitoring overall health (Novianti et al., 2023).

At its core, smart parenting aims to simplify routine tasks and render them more user friendly. It liberates parents from the constraints of traditional methods, allowing them to embrace a technologically advanced lifestyle that caters to their unique needs (Novianti et al., 2021). AI plays a pivotal role in the parenting journey, coordinating school calendars, planning extracurricular activities, and maintaining a harmonious balance between play and study (Livingstone & Blum-Ross, 2020).

By means of online parental assistance, digital technology provides a means of fostering family situations (Kirby, 2020). The complexities of modern life, marked by demanding academic pursuits, active work environments, and a plethora of extracurricular activities, weave an intricate web of challenges for parents (Mascheroni et al., 2018). In regard to navigating this confusing environment while managing work responsibilities, monitoring children’s academic development, and seizing the chance to participate in extracurricular activities, smart parenting shines hope (Yu et al., 2020).

When thinking about the function of a parent, technology includes a wide range of devices and programs designed to help parents with different chores and obligations. These tools might be anything from more sophisticated solutions such as smartphone apps and internet resources (Jabali et al., 2019) to more conventional approaches such as books and manuals. Conversely, artificial intelligence (AI) focuses on creating computer systems that are capable of

carrying out tasks that have historically required human intelligence (Chen et al., 2022). **Artificial** intelligence (AI)-enabled parenting aids could include smart devices, virtual assistants, and algorithms that provide tailored childcare advice or automate specific tasks (Yunike et al., 2023). While there are many tools available for parents to employ technology in their parenting, artificial intelligence (AI) primarily focuses on developing systems that can mimic human-like cognitive capabilities to assist parents in their jobs as caregivers (Chen et al., 2022).

The incorporation of AI into the smart parenting framework goes beyond mere mechanization of routine duties; it represents a holistic approach. In utilizing AI technologies, Smart Parenting presents a flexible and responsive solution to the demands of the contemporary environment, enabling parents to engage more deeply and profoundly with their children (Florea et al., 2020); AI-powered solutions provide flexible and adaptive tools aligned with the unique needs and difficulties faced by each family (Ramaekers & Hodgson, 2020). The promise of Smart Parenting lies in the intelligent curation of AI-powered solutions, which resonates with the diverse needs of contemporary family life (Florea et al., 2020; Harris et al., 2020). These options, ranging from intelligent scheduling algorithms to learning style-specific educational platforms and safety features, underscore the transformative potential of smart parenting (Yu, Chenke & Roque, 2020).

Parenting resources are available through digital media and web apps, particularly for young couples. Parenting programs with innovative mobile applications are becoming increasingly common, offering parents, namely, mothers, easily accessible and convenient alternatives (Alamiyah, 2020; Moon et al., 2019). Online parenting intervention techniques make technology accessible to diverse sociodemographic groups and enable communication with difficult-to-reach families (Jones et al., 2021). These programs benefit parents who cannot access in-person support options and allow them to join communities based on their needs and interests, providing internet-based help regardless of geographical or time disparities (Kirk & Milnes, 2016; Spencer et al., 2020). In 2019, David unveiled the Rational Parenting Coach (RPC) app, a mobile-first platform that makes interesting content easily accessible and customized to meet specific childcare needs (David, 2019). Rhodes et al. (2020) highlighted Baby Buddy, a free app strategically positioned to fulfill the different needs of parents, which delivers active direction to appropriate material. Feil et al. (2018) studied ParentNet, a low-income family's successful intervention that improves parenting practices and supports infant social communication and language development.

According to Beneteau et al. (2020), family interactions can be improved by using smart speakers, which are easily accessible for parents and families. Suarez et al., (2018) discussed "Educar en Positivo," also known as the positive parent program, which is an online intervention technique that has successfully increased parental confidence and role satisfaction. Hutchings et al. (2018) investigated the usefulness of the Confident Parent internet Guide (COPING), an online parenting resource that parents regularly consult for guidance on parenting-related issues. Together, these various apps show how parental assistance has evolved

technologically by providing specialized treatments that cater to each family's particular needs.

### 1.1 Impact of AI-assisted parenting on educational outcomes

AI-assisted parenting has significant effects on educational outcomes, as demonstrated through various technological innovations. Adaptive learning platforms, such as Khan Academy or Duolingo, leverage AI algorithms to customize educational content according to each child's learning pace and preferences, resulting in enhanced comprehension and retention of academic concepts (Minn, 2022). Additionally, virtual tutoring systems such as Squirrel AI or Brainly provide personalized support outside the classroom, assisting students in areas of difficulty and reinforcing learning objectives, leading to improved academic performance (Radianti et al., 2020). AI-powered homework assistants, such as Photomath or Socratic, offer instant solutions and step-by-step explanations for complex problems, empowering students to tackle assignments independently and deepen their understanding (Villegas-Ch et al., 2020). Smart parental monitoring apps such as FamilyTime or Qustodio utilize AI to track children's academic progress and online activity, enabling parents to provide timely support and guidance, ultimately contributing to better educational outcomes. Furthermore, automated learning analytics platforms such as BrightSpace or Moodle analyze student performance data to identify patterns and areas for improvement, enabling educators to tailor instruction and interventions to meet individual learning needs and thereby enhancing overall educational outcomes (Borenstein & Howard, 2021).

AI streamlines communication between parents and educators by furnishing them with data-driven feedback on a child's educational and developmental progress. Through AI-driven platforms tailored for parental engagement, personalized recommendations for at-home learning activities and strategies to support a child's educational journey are provided (Chen et al., 2022). For instance, examining how AI-driven educational apps or platforms aid children in learning specific subjects, such as mathematics or language skills, can provide insights into the efficacy of technology in supplementing traditional teaching methods (Lin et al., 2024). Moreover, investigating how AI-powered tutoring systems personalize learning experiences based on individual student needs and learning styles can shed light on their potential to enhance academic performance and engagement. Additionally, exploring the impact of AI-driven educational tools on parental involvement and communication between parents and teachers can offer valuable insights into how technology facilitates collaboration within the education ecosystem. AI-powered educational tools can adapt to individual children's unique learning styles and pace, providing immediate feedback and real-time analysis of performance across tasks, quizzes, and games (Berson et al., 2021). These tools enable parents and educators to identify areas for improvement and provide interactive support to children and learners.

## 1.2 Theoretical framework

Human-computer interaction (HCI) frameworks are being used in the Palestinian context to develop AI-enhanced parenting tools. These frameworks emphasize the importance of creating user-friendly, culturally relevant, and accessible interfaces and functionalities (Jebeli et al., 2024). They emphasize the need for intuitive and easy-to-navigate technology that resonates with the cultural norms and preferences of Palestinian parents. AI-powered parenting applications and tools should offer clear navigation, clear instructions, and culturally sensitive content for easy access to resources (Nguyen et al., 2023).

Accessibility is another key aspect of HCI frameworks (Kazim & Koshiyama, 2021). In the context of AI-assisted parenting in Palestine, tools should accommodate diverse linguistic, cultural, and socioeconomic backgrounds. Features such as multilingual support, culturally relevant content, and user-friendly interfaces are crucial for inclusivity (Reiss, 2021). Effectiveness is also a key aspect of HCI frameworks (Nguyen et al., 2023). In the Palestinian context, AI tools should facilitate positive parent–child interactions, streamline daily caregiving tasks, and provide valuable insights and recommendations.

Continuous feedback loops ensure that AI tools are continuously refined to better meet user needs, leading to more effective and user-friendly products. (Aldoseri et al., 2024).

Integration into daily routines is another key aspect of HCI frameworks (Nguyen et al., 2023). AI-powered scheduling assistants should align with Palestinian parents' schedules and cultural norms, sending reminders and notifications at culturally appropriate times and in culturally relevant ways. This integration ensures that AI-enhanced parenting tools become indispensable companions in Palestinian households, aiding parents in their caregiving responsibilities while respecting their cultural values and traditions (Villegas-Ch et al., 2020).

## 1.3 AI-Assisted parenting of Palestine

Palestinian children and their families often experience mental trauma during armed conflict, with varying vulnerability levels. Therefore, child-rearing practices play a significant role in helping children cope with the difficulties caused by poor mental health (Diab et al., 2018). Living in armed conflict affects parents' child-rearing practices and discipline measures. A study by Kamal et al. revealed that Palestinian mothers use more severe physical and psychological discipline strategies due to their privation, suffering, younger age, and less education (Kamal et al., 2018).

Routine childrearing methods play a crucial role in children's social, emotional, intellectual, physical, and spiritual development by meeting their basic needs, such as welfare, education, love, and material possessions (Ekpo & Igbokwe, 2015). Parents also help their children embrace their societal traditions and culture (Choi et al., 2013). Palestinian families, rooted in cultural traditions, are eager to adopt new parenting styles that complement or replace traditional practices (Atout et al., 2021). In

a rapidly changing world, they are curious about integrating modern approaches into their roles. This openness to innovative methodologies has fostered a spirit of receptivity, blending traditional values with progressive techniques. This exploration of diverse parenting styles signifies a forward-looking attitude within Palestinian communities, aiming to nurture the next generation in a way that harmonizes tradition and modernity.

The idea of “smart parenting” presents itself as a fresh and ground-breaking phenomenon in the constantly evolving Palestinian parenting scene. The adoption of smart solutions in parenting practices represents a substantial shift from conventional methods as technology continues to transform everyday life. The emergence of Smart Parenting in Palestine marks an entirely new paradigm, offering cutting-edge methods and technologies to address the changing demands of raising children in the twenty-first century. As Palestinian parents traverse a new era in which smart applications, artificial intelligence tools, and digital platforms play a crucial role in improving routine management and developing an enhanced parent–child bond, this emerging phenomenon indicates an unprecedented incorporation of technology.

Smart parenting is an AI-powered strategy that aims to provide tailored help to families in the Palestinian context, addressing unique challenges such as geopolitical, economic, and cultural factors. It incorporates AI-powered scheduling, educational support, and health monitoring tools to help Palestinian parents manage work obligations and academic goals and provide a loving home for their children. This progressive method offers Palestinian parents a technologically enabled structure to mentor, encourage, and establish deep relationships with their children, addressing the unique challenges faced by Palestinian families.

#### **1.4 Statement of the problem**

This study seeks to comprehend the attitudes and utilization trends of AI-enabled smart parenting strategies among Palestinian households. It endeavors to probe the reception, frequency of application, and efficacy of these AI mechanisms in optimizing parental duties and nurturing the parent–child bond. Furthermore, the investigation delves into the seamless integration of these AI solutions into the daily routines and usage habits of Palestinian caregivers while considering the distinctive geopolitical, economic, and cultural milieu of the region.

#### **1.5 Significance of the study**

The significance of grasping the perceptions and usage patterns of AI-driven smart parenting techniques among Palestinians is multifaceted. First, it illuminates the reception and efficacy of technological assimilation into conventional parenting methodologies within a distinct cultural background. Second, it offers insights into tailoring AI interventions to address the specific challenges encountered by Palestinian families, including geopolitical complexities and economic limitations. Third, the study’s outcomes can guide the development of culturally sensitive AI tools for

parental assistance, thus fostering improved familial dynamics and children's well-being within the Palestinian community.

### **1.6 Research questions**

The purpose of this study is to examine how Palestinians view AI-powered smart parenting techniques and how they feel about incorporating technology into conventional parenting approaches. Additionally, it evaluates how frequently Palestinians use AI tools for smart parenting, examining how well they fit into daily schedules and usage trends. By offering detailed knowledge of how technology interacts with conventional parenting techniques, this research seeks to shed light on the acceptance and use of AI in smart parenting within the Palestinian setting.

- 1- To what extent do participants engage with AI-assisted parenting?
- 2- What are participants' perceptions of AI-assisted parenting?
- 3- Are there statistically significant differences in the frequency of utilizing AI tools for routine parenting tasks that can be attributed to sociodemographic variables such as age, gender, number of children, type of faculty, educational background, and academic title?
- 4- Are there statistically significant differences in the perceptions of parents in Palestine about the usefulness of AI applications for managing particular routine parenting duties based on sociodemographic variables such as age, number of children, faculty type, educational background, and academic title?

### **1.7 Research hypotheses**

- 1- There was no significant difference in the level of engagement with AI-assisted parenting among participants.
- 2- Participants' perceptions of AI-assisted parenting do not vary significantly.
- 3- There were no statistically significant differences in the frequency of utilizing AI tools for routine parenting tasks based on sociodemographic variables.
- 4- There are no statistically significant differences in the perceptions of parents in Palestine about the usefulness of AI applications for managing particular routine parenting duties based on sociodemographic variables.

## **2 Materials and methods**

This study used a quantitative descriptive research approach to analyze and contextualize AI-assisted parenting.

### **2.1 Research population and sample**

To administer the survey, the researchers used Google Forms, taking advantage of its user-friendliness and accessibility. By using Google Forms, a digital questionnaire

that could be distributed and completed online by participants was made possible. The utilization of Google Forms allowed the researchers to distribute the survey broadly through a variety of channels, including social media, email, and online forums, which was in keeping with the objective of reaching a wide and diverse sample of parents. An easy random sampling procedure was used to guarantee the sample's integrity and representativeness. Using this method, participants were chosen at random from the target demographic, which in this case was Palestinian parents. The findings are more broadly applicable to the larger community of Palestinian parents since random sampling reduces bias and guarantees that every member of the population has an equal chance of being chosen.

First, the sample consisted of 230 parents. Nevertheless, 204 completed surveys that could be used for statistical analysis were acquired after the questionnaire was distributed and replies were gathered. This procedure was designed to ensure that only high-quality data that met the requirements for analysis were included. Complete surveys were those in which respondents answered every question that needed to be answered, allowing for thorough and trustworthy statistical analysis of the information. The distribution of the participants in the research sample is shown in Table 1. The participants were divided into groups according to the independent variables that each group represented.

Table 1 provides a detailed analysis of the demographic makeup of the study participants, revealing key variables such as gender, faculty affiliation, educational background, academic title, age distribution, and number of children. The sample

**Table 1** Demographic variables

Variable	Level	Count	%
<b>Gender</b>	Male	114	56.2
	Female	89	43.8
<b>Faculty</b>	Scientific	105	51.7
	Humanities	98	48.3
<b>Educational Background</b>	Bachelor's degree	16	7.9
	Master's degree	42	20.7
	PhD degree	145	71.4
<b>Title</b>	Lecturer	32	15.8
	Instructor	25	12.3
	Assistant Professor	74	36.5
	Associate Professor	33	16.3
	(Full) Professor	39	19.2
<b>Age</b>	18–24 years	24	11.8
	25–34 years	31	15.3
	35–44 years	55	27.1
	45–54 years	45	22.2
	more than 55 years	48	23.6
<b>Number of Children</b>	1–3	55	27.1
	4 – 6	85	41.9
	more than 6	63	31



is predominantly male (56.2%) and female (43.8%), with the majority of participants from the Scientific faculty (51.7%). The majority of participants held a PhD (71.4%), followed by a master's degree (20.7%) and a bachelor's degree (7.9%). The academic title distribution is diverse, with Assistant Professors (36.5%), Full Professors (19.2%), Associate Professors (16.3%), Lecturers (15.8%), and Instructors (12.3%). The age distribution is broad, with the largest percentage falling into the (35–44) year old range (27.1%), followed by (45–54) year old (22.2%), and over 55 years old (23.6%). Regarding family composition, the majority of participants had (4–6) children (41.9%), followed by those with (1–3) children (27.1%) and more than 6 children (31%).

## 2.2 Data analysis

The analysis used both the one sample t test and stepwise multiple regression techniques to examine the specifics of participants' views about AI-assisted parenting and reveal how closely these views align with predetermined standards as well as the underlying predictors influencing these perceptions.

## 2.3 Study tool

The questionnaire comprised two sections (Appendix 1). The first section collected demographic information, such as gender, faculty, level of education, and place of residence. The second section consisted of items pertaining to the study's objectives; it had two domains and was designed to assess AI-assisted parenting among Palestinian university staff members. The first domain was meant to assess engagement with or the frequency of using AI tools in parenting tasks, such as school support, extracurricular activities, and monitoring children's health. The responses are categorized into five levels: always, frequently, occasionally, rarely, and never. The second domain was crafted to explore perceptions of AI-assisted parenting effectiveness in managing parenting tasks, reducing parental stress, promoting child development, addressing privacy concerns, and influencing family dynamics. Responses are rated on a five-point Likert scale ranging from strongly agree to strongly disagree.

The process of developing the questionnaire for this study was methodical and thorough, aiming to guarantee its quality and effectiveness in gathering pertinent data. It commenced with an extensive examination of the literature on AI-assisted parenting, enabling the researchers to identify key themes, concepts, and variables relevant to the topic. Drawing from this literature review, each question in the questionnaire was meticulously formulated, taking into account the theoretical frameworks and principles established in prior studies.

Furthermore, to ensure the clarity, relevance, and comprehensiveness of the questionnaire, it was scrutinized by a panel of experts with diverse backgrounds in parenting, technology, and education. These experts provided valuable insights and feedback, which were incorporated into refining the questionnaire further. Their input helped enhance the questionnaire's suitability for the target audience, ensuring that it captured the essential aspects of AI-assisted parenting practices.

A pool of thirty-two items was created, which were then reviewed by eight specialist arbitrators. The correlation between each item and the total number of items was evaluated, with items with correlations less than 0.60 removed. The experts assessed each remaining item's lower and upper quartile scores using a *t* test. Only 20 items (ten for each domain) were added to the tool, removing any that did not significantly differ between the quartiles.

To determine the instrument's appropriateness for measuring variables under investigation, factor validity and reliability were assessed, as shown in Table 2. Validity ensures that the items in a scale accurately represent the theoretical construct being measured, while reliability ensures consistent and stable results over time and across different conditions.

The findings in Table 2 show the factorial validity and reliability of two different domains within AI-assisted parenting: engagement with AI-assisted parenting and perceptions of AI-assisted parenting. The factorial validity and reliability of the measured factors are quite high, indicating internal consistency in the structures they represent and successful measurement of the constructs.

With factor loadings ranging from 0.735 to 0.971, all components for the first domain factor loaded significantly onto the factor. This suggests strong factorial validity, as there is a strong correlation between each item and the underlying factor. Furthermore, at 0.564, the factor's explanation of variation is significant. The internal consistency reliability is high, as indicated by the very high McDonald's  $\omega$  and Cronbach's  $\alpha$  values (0.96 and 0.959, respectively).

### 3 Results

To answer the first two questions: (1) To what extent do participants engage with AI-assisted parenting? and (2) What are participants' perceptions of AI-Assisted Parenting?, the researchers used the One Sample *t* test. The results are provided in Table 3.

The study used one-sample *t* tests to evaluate participants' engagement with and perceptions of AI-assisted parenting. The results showed significant differences in engagement with AI-assisted parenting tools and practices compared to expected levels. The mean score was 3.375, with a standard deviation of 0.842. The *t* test yielded a highly significant outcome ( $t = -13.9, p < .001$ ), indicating a substantial deviation from the designated threshold of 4.2. The negative *t* value suggests a significantly lower level of engagement, while the positive *p* value of 0.67 suggests a high level of engagement in AI-assisted parenting.

In the second domain, respondents' perceptions of AI-assisted parenting were slightly lower at 3.217, with a smaller standard deviation of 0.622. The *t* test yielded a notable outcome ( $t = -4.19, p < .001$ ), indicating a clear departure from the predetermined threshold. A negative *t* value suggests a level below high, while a positive *p* value suggests a moderate level of engagement.

These results highlight significant differences between participants' opinions and set standards in both areas of AI-assisted parenting. These discrepancies call for careful analysis and a rethinking of current frameworks or treatments to better meet

Table 2 Factorial validity and reliability

Factor	Item	Factor loading	Variance	McDonald's $\omega$	Cronbach's $\alpha$
Engagement with AI-Assisted Parenting	Monitoring the health and well-being of children.	0.971	0.564	0.96	0.959
	Meal and house chores planning.	0.923			
	Organizing extracurricular activities.	0.866			
	School-related tasks and academic support and guidance.	0.861			
	Supporting social interactions and friendships.	0.812			
	Guidance on personal responsibility (budgeting, self-care).	0.799			
	Tracking and understanding the developmental milestones of children.	0.794			
	Monitoring screen time and technology use by children.	0.792			
Perceptions of AI-Assisted Parenting	Assisting with time management and scheduling.	0.766	0.183	0.887	0.884
	Discussing and guiding decisions related to future plans.	0.735			
	AI applications are perceived as effective tools for providing educational support and socialization.	0.882			
	AI applications align well with the cultural values of Palestinian families.	0.811			
	Parents report an enhanced sense of confidence in their parenting abilities through the support of AI applications.	0.797			
	The use of AI in Smart Parenting leads to time savings for parents	0.716			
	AI tools are considered user-friendly and easy to navigate.	0.67			
	Total		0.747	0.949	0.947

**Table 3** One sample t test

Domain	Test Value			4.2		3.4		2.6	
	M	SD	df	t	p	t	P	t	P
Engage- ment with AI-assisted parenting	3.375	0.842	202	-13.9	< 0.001	-0.42	0.677		
Perceptions of AI-assisted parenting	3.217	0.622	202			-4.19	< 0.001	14.14	< 0.001

the changing requirements and expectations of individuals involved in AI-assisted parenting practices.

To answer the third and fourth questions, “3) Are there statistically significant differences in the frequency of utilizing AI tools for routine parenting tasks that can be attributed to sociodemographic variables such as age, gender, number of children, type of faculty, educational background, and academic title? and 4) Are there statistically significant differences in the perceptions of parents in Palestine about the usefulness of AI applications for managing particular routine parenting duties based on sociodemographic variables such as age, number of children, faculty type, educational background, and academic title?”, the researchers used correlation analysis and stepwise multiple regression.

In order to investigate the relationships between the dependent variables, “DIR1: Engagement with AI-assisted parenting” and “DIR2: Perceptions of AI-assisted parenting,” the researchers carried out a correlation analysis, and the results are presented in Table 4. The results demonstrated a substantial link between “DIR1” and the faculty variable, revealing a remarkably robust association. Furthermore, a moderate association was observed with views regarding AI-assisted parenting,

**Table 4** Correlation matrix

	DIR1	DIR2	Age	Number of children	Gender	Faculty	Background	Title
DIR1								
DIR2	0.62							
Age	-0.27	-0.21						
Number of Children	-0.21	-0.20	0.67					
Gender	-0.29	-0.20	0.09	0.06				
Faculty	-0.71	-0.57	0.14	0.13	0.34			
Background	-0.10	-0.07	0.67	0.53	0.01	-0.02		
Title	-0.14	-0.17	0.76	0.61	0.06	0.04	0.68	

DIR1:Engagement with AI-assisted parenting

DIR2:Perceptions of AI-assisted parenting

indicating a noticeable but weaker relationship. In contrast, it seems that relationships with other factors were not very strong.

As shown in Table 5, the researchers used Stepwise Multiple Regression analysis for a more in-depth investigation and comprehension of these associations. Through a methodical examination of the ways in which different independent variables together predicted “DIR1” and “DIR2,” this approach provided important insights into the intricate dynamics inside the dataset.

The study revealed that faculty affiliation significantly impacts engagement in AI-assisted parenting, with a significant negative correlation between faculty and the first domain. Participants in scientific faculties are more engaged with AI-assisted parenting than are those in humanities faculties. The second model, which includes the predictor variable “Perceptions of AI-Assisted Parenting,” shows a positive correlation with AI-Assisted Parenting, with faculty members showing a negative correlation with the first domain. However, participants in scientific faculties have more positive perceptions of AI-assisted parenting.

The third model, which includes the predictor variable “Age,” shows an even stronger explanatory power, with an R-squared value of 59%. This indicates that the inclusion of age improves the model’s capacity to predict AI-assisted parenting. Although “Age” has a negative connection with the first domain, “Faculty” and “Perceptions of AI-Assisted Parenting” remain important predictors. The Age variable has four levels, and it is evident that “Engagement with AI-Assisted Parenting” scores are often lower for older individuals. Younger participants, however, are more engaged with AI-assisted parenting than their older counterparts. This implies that “Engagement with AI-Assisted Parenting” scores are often lower for older people. Younger participants proved to be more engaged with AI-assisted parenting than their older counterparts. They also had more positive perceptions of AI-assisted parenting. The formula for this model is:

**Table 5** Stepwise multiple regression

Model		$R^2$	B	T	$p$	F	$P$
1	(Constant)	0.502	5.142	39.255	< 0.001	202.52	< 0.001
	Faculty		-1.191	-14.231	< 0.001		
2	(Constant)	0.572	3.287	9.501	< 0.001	133.7	< 0.001
	Faculty		-0.885	-9.38	< 0.001		
	Perceptions of AI-Assisted parenting		0.435	5.729	< 0.001		
3	(Constant)	0.59	3.684	10.088	< 0.001	95.459	< 0.004
	Faculty		-0.879	-9.487	< 0.001		
	Perceptions of AI-Assisted parenting		0.4	5.291	< 0.001		
	Age		-0.088	-2.949	< 0.001		

a Dependent Variable: DIR1

$$\text{Dir1} = 3.684 - 0.879 \times \text{Faculty} + 0.4 \times \text{Dir2} - 0.088 \times \text{Age}$$

Overall, the study highlights the importance of faculty affiliation, perceptions of AI-assisted parenting, and age in shaping engagement with AI-assisted parenting.

## 4 Discussion

The current study attempted to explore Palestinians' engagement with and perceptions of AI-assisted parenting. Data analysis revealed that there is a high level of engagement in AI-assisted parenting (Diab et al., 2018; Virani et al., 2019; Yu, Chenke, and Roque, 2020). From a purely Palestinian standpoint, there might be a number of reasons for the substantial level of AI-assisted parenting participation. First, Palestinians have started to realize how technology may improve many facets of life, including parenting (Livingstone & Blum-Ross, 2020). Therefore, there could be cultural willingness and openness to implementing AI techniques and technologies to aid in parenting efforts. Furthermore, Palestinian families can view AI-assisted parenting as a way to help them deal with the difficulties of contemporary living, such as balancing job and family obligations or attending to their children's educational demands in a setting that is becoming increasingly competitive (Davidoff et al., 2006). Artificial intelligence (AI) applications can provide useful assistance and solutions for organizing home chores, keeping an eye on kids' activities, and promoting family communication. Additionally, university staff can try novel ideas and evaluate their own methods, which may include incorporating online technology into parenting and teaching (Jabali et al., 2023).

Parents may also be encouraged to look for creative parenting techniques due to the political unpredictability and economic difficulties of the Palestinian situation (Kamal et al., 2018). Parenting tools with AI assistance might be seen as a means of offering extra resources and support for children's growth, particularly in situations where traditional support systems or good educational opportunities are not available (Virani et al., 2019). Furthermore, a wider spectrum of families may now utilize AI-assisted parenting solutions due to the prevalence of cell phones and internet connectivity in Palestinian culture (Alamiyah, 2020). Given that parents are more willing to investigate and embrace easily accessible and user-friendly technology solutions, accessibility may play a role in the high level of involvement.

The study findings also showed that the sample's level of perception (e.g., AI applications are deemed effective in providing educational support and socialization, aligning with Palestinian cultural values). They boost parents' confidence in parenting, save time, and are user-friendly, making them a valuable tool in smart parenting, thereby enhancing their parenting abilities as stated by (Lin et al., 2024). of AI-assisted parenting is moderate. AI technologies that support learning and social connection are valued by Palestinian parents. Parents' impressions can be positively impacted by aligning AI applications with cultural values that are important to Palestinians, such as community and customs (Nguyen et al., 2023). Help from AI can boost parental confidence because of Palestine's difficult sociopolitical climate (Choi et al., 2013). Parents' worries and anxieties might be reduced with helpful

support and direction. AI products' time-saving features are especially common in Palestinian homes, where parents frequently juggle a number of tasks. In regard to low levels of digital literacy and restricted access to technology, the perceived ease of use of AI technologies is critical. Palestinian parents are more inclined to accept AI as a useful tool for their parenting journey if they believe it to be user friendly.

The researchers found that most of the demographic variables had no impact on the sample's engagement with and perceptions of AI-assisted parenting. The study suggested that gender, family size, and educational background do not significantly influence engagement in AI-assisted parenting in Palestine (Ekpo & Igbokwe, 2015). This is due to cultural norms, socioeconomic factors, technological access and literacy, the perceived utility of AI tools, and cultural acceptance. Traditional gender roles in Palestinian society may not significantly influence attitudes toward AI-assisted parenting, as parenting responsibilities are often shared among family members. Socioeconomic factors, such as income level, access to technology, and employment status, may have a more significant impact on engagement with AI tools (Kirby, 2020). Access to technology and digital literacy levels are crucial factors influencing engagement in AI-assisted parenting. The perceived utility of AI tools may override demographic factors, and cultural acceptance may drive the adoption of these practices (Nguyen et al., 2023).

However, participants' age and the faculty they serve in prove to be influential for young people and for those working in scientific faculties (Mascheroni et al., 2018). Because they are more comfortable with digital devices and have greater familiarity with technology, younger participants, often known as digital natives, are more inclined to interact with AI-assisted parenting tools (Harris et al., 2020). Additionally, they could be more knowledgeable about the technical underpinnings of AI applications, which might enable them to evaluate the effectiveness of AI-assisted parenting tools with greater objectivity. AI-assisted parenting tools may seem more appropriate for younger people, particularly those who are just starting families or are in the early phases of motherhood.

Academics with scientific backgrounds might be able to see how AI technology might improve productivity and efficacy in a variety of jobs, including raising children. Younger generations may be more inclined to adopt technological advancements in parenting if society transforms to one that is more focused on technology (Flores et al., 2020). They may be better able to make educated judgments about using these technologies if they have access to resources and knowledge regarding AI-assisted parenting. Individuals with access to resources and knowledge about AI-assisted parenting (e.g., doctors, engineers and IT specialists) are better equipped to make informed decisions about its adoption, evaluate its advantages and drawbacks, and make educated judgments based on their understanding of the technology.

## 5 Conclusion

The study revealed a high level of participation in AI-assisted parenting practices among Palestinians, indicating a willingness to embrace technology in parenting. This is attributed to Palestinian culture's recognition of the potential of technology

to enhance various aspects of life, such as parenting. The study also revealed that political instability and economic hardships in Palestine may motivate parents to adopt alternative parenting strategies. The widespread availability of smartphones and internet connectivity in Palestinian society has increased accessibility to AI-assisted parenting solutions. However, demographic variables such as gender, family size, and educational background did not significantly influence engagement. The participants' age and academic background were identified as influential factors, with younger individuals and those in scientific faculties showing greater engagement.

## 5.1 Strengths

The strength of this study lies in its comprehensive demographic analysis, which considers key variables such as gender, faculty affiliation, educational background, academic title, age distribution, and number of children. The representative sample, comprising participants from diverse academic backgrounds and age groups, enhances the generalizability of the findings and provides a well-rounded perspective on the research topic.

## 5.2 Limitations

Despite its advantages, demographic analysis has a number of drawbacks. One significant drawback is the gender disparity in the research sample, which shows a larger proportion of male than female participants. With regard to gender-specific concerns in AI-assisted parenting in particular, this gender gap may add bias to the findings and restrict their application. Notably, males outnumber their female counterparts in the Palestinian labor market. Furthermore, sampling bias may have been introduced by the study's focus on participants who were predominantly linked with scientific faculties, which might have skewed the results toward viewpoints that are common in these fields.

This gender imbalance is particularly significant in the context of gender-specific considerations in AI-assisted parenting, as it may introduce bias into the findings and hinder their broader applicability. It is important to acknowledge that this gender gap mirrors broader societal trends, such as the overrepresentation of males in the Palestinian labor market, which could influence participants' perceptions and experiences related to AI-assisted parenting. Furthermore, the sampling bias introduced by the study's focus on individuals who were predominantly affiliated with scientific faculties presents another limitation. By disproportionately representing individuals from specific academic disciplines, such as the sciences, the study may inadvertently skew the results toward viewpoints that are prevalent within these fields. Consequently, the findings may not accurately reflect the perspectives and experiences of individuals from other academic backgrounds or nonacademic contexts.



### 5.3 Practical implications

This study aims to inform the development of educational programs and policies for integrating AI-assisted parenting practices into parenting education curricula. This study provides insights for educators, technology developers, researchers, and parents. Educators can tailor their programs to meet diverse demographic needs, while developers can create more user-friendly and culturally sensitive AI tools. Researchers can explore demographic factors' influence on attitudes toward AI-assisted parenting, deepening our understanding of the factors driving adoption. Parents and families can benefit from the study's insights by understanding how demographic factors influence their perceptions and engagement with AI-assisted parenting practices. This knowledge can lead to informed decisions about AI technology use, potentially improving outcomes for individuals and their children.

### 5.4 Future recommendation

Future studies should focus on resolving the constraints noted in demographic studies. To reduce prejudice and improve the generalizability of the findings, a more diverse pool of candidates across genders and academic fields should be hired. Furthermore, cross-cultural comparisons can shed light on how culture shapes attitudes toward AI technologies in parenting practices, and longitudinal studies can shed light on how demographic factors influence changes in perceptions and engagement with AI-assisted parenting over time. Finally, using mixed-methods approaches can improve the interpretation of study findings by providing a more in-depth understanding of the underlying motives and experiences of people interacting with AI systems.

## Appendix 1: Study survey

We are conducting a research study titled **“Smart Parenting: Effortless Routine Engagement with AI Support: A Quantitative Study”**. You are invited to complete a survey, which will be confidential and used solely for research purposes.

Thank you,  
The authors.

### Demographic Variables

#### 1- Age of the parents:

- 18-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- years and above

**2- Number of children**

- 1-3
- 4-6
- More than 6

**3- Type of Faculty**

- Scientific (Medicine, Engineering and IT, Sciences)
- Humanities and Education (Economy, Sharea'a, Law, Fine Arts)

**4- Educational Background of Parents:**

- Bachelor's degree
- Master's degree
- PhD degree

**5- Academic Title**

- Lecturer
- Instructor
- Assistant Professor
- Associate Professor
- (Full) Professor

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First domain: Tools and practices of AI-Assisted Parenting

No.	Item	Always	Frequently	Occasionally	Rarely	Never
1	School-related tasks and academic support and guidance.					
2	Organizing extracurricular activities.					
3	Monitoring screen time and technology use by children.					
4	Supporting social interactions and friendships.					
5	Assisting with time management and scheduling.					
6	Guidance on personal responsibility (budgeting, self-care).					

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7	Discussing and guiding decisions related to future plans.
8	Meal and house chores planning.
9	Monitoring the health and well-being of children
10	Tracking and understanding the developmental milestones of children

Second domain: Perspectives toward AI-Assisted Parenting

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	AI applications effectively assist in managing daily parenting tasks.					
2	Using AI applications reduces parents' overall stress levels.					
3	AI applications provide valuable opportunities for promoting the cognitive and social development of children.					
4	Some parents express concerns about the security and privacy implications of using AI.					
5	The use of AI applications has a positive impact on the dynamics within the family.					

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- |    |   |
|----|---|
| 6  | AI tools are considered user-friendly and easy to navigate.   |
| 7  | Parents report an enhanced sense of confidence in their parenting abilities through the support of AI applications. |
| 8  | The use of AI in Smart Parenting leads to time savings for parents  |
| 9  | AI applications are perceived as effective tools for providing educational support and socialization.               |
| 10 | AI applications align well with the cultural values of Palestinian families.  |
- 

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**Data availability** The data that support the findings of this study are available from the corresponding author upon special request.

## Declarations

**Competing interests** None.

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