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# Influence of parental stress on online learning engagement among parents in Arab nations

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## ABSTRACT

This study examines the impact of parental stress on engagement with online learning during and after the COVID-19 pandemic in Arab nations. A total of 729 parents from various Arab countries participated in the study by completing a 42-item questionnaire that measured four types of stress—personal, academic, technical, and financial—as well as behavioural, emotional, and cognitive engagement. Demographic factors, including gender, income, number of children, and country of residence, were found to correlate with different levels of stress and engagement. Structural Equation Modelling (SEM) and Confirmatory Factor Analysis (CFA) were employed to validate the relationships between stress and engagement, while MANOVA explored the effects of demographic variables. The results show that personal and academic stress positively influence all forms of engagement, while technical stress has a significant negative effect. Financial stress did not demonstrate a measurable impact on parental engagement. The findings highlight the need for targeted strategies to manage parental stress, particularly personal and academic, to improve parental involvement in online education. These insights are crucial for policymakers and educators in developing support systems for parents during transitions to online learning environments.

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## KEYWORDS


The COVID-19 pandemic; parents' stress; parents' engagement; online learning

## Introduction

The transition to online education during – and even following – COVID-19 has caused disruptions to the lives of students, teachers, and parents, including caregivers and guardians (Psocka, 2022). One of these disruptions includes transitions to at home online learning (Adedoyin & Soykan, 2023; Slack & Priestley, 2023). This transition has impacted not only students but also teachers and parents as well (Haidi & Hamdan, 2023; Singh et al., 2023). As will be discussed below, research has investigated various forms of parental experience (focusing on their involvement, motivation, burnout, and stress) during online learning of their children. Furthermore, as will be discussed below, some of the prior research has investigated the parental experience of children in either preschool, primary or secondary school.

Many existing studies investigated students' perceptions of online learning during COVID-19 (Akaslan & Law, 2011; Giray et al., 2022; Mohan et al., 2021; Muilenburg & Berge, 2005; Oketch, 2013; Yukselturk & Bulut, 2007). Yet, as we discuss below, fewer studies have investigated the impact of online learning on parents (Adams et al., 2021; Freisthler et al., 2021; Yang et al., 2021;

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Yu et al., 2021). Most of these studies have shown that the transition into online learning has caused stress in parents (Achterberg et al., 2021; Bikmazer et al., 2021; Calvano et al., 2022; Su et al., 2022). Along these lines, many parents have reported experiencing burnout due to school closure and the transition to online learning during the COVID-19 pandemic (Nyanamba et al., 2022). Importantly, burnout in parents was found to impact their motivation to assist their children with online learning during the COVID-19 pandemic (Limbers, 2021).

While parents and caregivers very much appreciate being involved in the process of online teaching of their children (Levickis et al., 2023), some have suffered from stress and anxiety due to taking on additional work (Kabir et al., 2021). Along these lines, Treceñe (2022) argued that the problems parents or caregivers face at home are related to additional work they take at home, including being proxy teachers. Moreland-Russell et al. (2022) found that hybrid learning due to covid-19 was associated with poor mental health of parents. This is probably the case as hybrid schooling involves transitions between online learning at home as well as going to school some days. Due to the sudden transition during and post COVID-19 pandemic, students' and parents' mental health was negatively impacted (Nuryana et al., 2022; Suyadi & Selvi, 2022).

The current study investigates the different types of stressors (academic, personal, technical, and financial; all are defined and discussed below) that parents may experience during the online learning of their children. In addition, we will also investigate how different types of stress parents experience impact their behavioral, emotional, and cognitive engagement with children's online education. This is different from most prior studies, which focus on investigating behavioral, emotional, and cognitive engagement in students (Li & Lerner, 2013; Park & Yun, 2018; Wang & Eccles, 2012).

## Literature review

In this section, we will first discuss prior studies conducted in Arabic and Eastern countries related to online learning during and post the COVID-19 pandemic. Following that, we will discuss factors that could impact effective online learning during the COVID-19 pandemic.

### *Arab and Eastern countries' studies on online learning during COVID-19*

In this section, we discuss existing studies from Arab and Eastern countries on parental involvement, engagement, and stress due to the transition to online learning of their children during COVID-19.

Many studies on parental experiences with children's online learning were conducted in Asia. For example, in a recent study conducted in China, Han et al. (2022) found that parents' views on online learning of their children were related to the ease of use of these online teaching platforms, their cost, as well as whether they include performance evaluation. In a large-scale study with over 18,000 middle-school students in China, it was found that parents play a key role in facilitating their children's online learning (Liu et al., 2022). The authors also suggested that schools should support parents and caregivers in order for them to be able to help their children during online learning. In a study conducted in Hong Kong, it was found that most students preferred in person schools than online education (Zheng et al., 2022). One study was conducted in India, which investigated the attitudes of students, teachers, and parents toward online learning. Parents expressed concerns regarding an increase in workload and screentime for their children during online learning (Gupta et al., 2022).

There have been a large number of studies conducted in Indonesia regarding parental involvement with children's online learning during and following the COVID-19 pandemic. For example, research conducted in Indonesia has shown that there is a mixed opinion of parents on online learning for their children (Jamilah & Fahyuni, 2022; Nasir et al., 2021). In a recent study also conducted in Indonesia, it was found that parents value online education positively if teachers, parents, school staff, and government are involved and supporting educational programs (Jumareng et al., 2022).

In another study also conducted in Indonesia, Maksum et al. (2022) tested both parents and children about their experience of online education. They found that children perceive online education positively, while parents perceive it negatively. It is possible that this is the case due to the stress parents face in order to accommodate their children's educational needs. In another study in Indonesia, Lase et al. (2022) found that online learning has increased the economic burden and worsened the psychological wellbeing of parents. Another study conducted in Indonesia found that financial hardships (e.g. internet use prices) may negatively impact online learning (Nurdin et al., 2022).

There are fewer number of studies conducted in the Middle East and Arab countries regarding the experiences of parents due to online learning of their children. In a study conducted in Saudi Arabia, Alharthi (2023) found that parents found the transition to online learning increased their caregiving burden and many did not wish to take on the responsibility of schooling their children at home. Another study conducted in Saudi Arabia investigated the perception of working mothers on their children's online learning (Aladsani, 2022). It was found that most of the key issues discussed by the mothers centered on financial issues (e.g. laptops used for online learning may break down) and educational issues (e.g. quality of online learning). Although not measured in the current study, stress and anxiety could be related to mothers' financial and educational concerns. In Iran, it has also been reported that the transition to online learning during COVID-19 has led to stress in both children and in turn parents (Widiasih et al., 2022). Some of the concerns parents have experienced were that their children may develop internet addiction due to spending a long time on the internet. Similar findings were reported in Turkey (Bikmazer et al., 2021).

### ***Factors impacting online learning during and post COVID-19***

Parental engagement with children's online learning during the COVID-19 pandemic refers to the behaviors of parents related to assisting their children with online learning during the pandemic (Novianti & Garzia, 2020). Several papers have investigated the impact of online learning on students' behavior and engagement during the COVID-19 pandemic (Garbe et al., 2020; Hussein et al., 2020; Oraif & Elyas, 2021; Salas-Pilco et al., 2022). However, to the best of our knowledge, only two studies have investigated parental engagement with children's online learning during the COVID-19 pandemic (Hafidz et al., 2020; Novianti & Garzia, 2020). Novianti & Garzia (2020) found that many of the parents who participated in the study faced problems dividing time between supervising study time of their children, accompanying children in learning, and providing learning facilities to their children. Hafidz et al. (2020) found that while many of the parents who participated in the study assisted their children, some had difficulties understanding and helping with the complexities of online learning of their children. Accordingly, both studies reported that parents encountered difficulties and problems with helping their children with online learning. However, these studies did not examine the impact of different types of stress from online learning on parents' engagement with their children's online learning during COVID-19.

In this section, we first discuss caregivers' stress and how that may impact online learning for their children. After that, we discuss demographical variables related to parents and how these may affect online learning of their children.

It is important to note that there are different kinds of stressors related to parental engagement with their children's online education, including financial, technical, academic, and personal. Financial stress refers to financial difficulties related to online learning, such as the need for additional software and computer facilities for all children at school. Technical stress, on the other hand, relates to problems with the ability to use educational software. Academic stress is related to knowledge of pedagogical methods related to online learning. Personal stress is a general form of stress related to adjustment to life changes due to the transition to online learning. It is important to note that most prior studies have only investigated one type of stress. In the current study, we will investigate all four kinds of stressors in relation to parental engagement.

### *Caregivers' stress*

Here, we discuss the different types of stressors that parents may face during online learning of their children. Parental stress could stem from a lack of knowledge on teaching and pressure to taking on additional pedagogical responsibilities (Abo Hamza & Elsantil, 2023; Alharthi, 2023; Garbe et al., 2020; Kabir et al., 2021; Seguin et al., 2021; Spinelli et al., 2020). Stress in parents could also stem from whether they have a job (Aladsani, 2022; Khan, 2014). Stress is important to study as it impacts performance and engagement in general (Hornby & Lafaele, 2011).

Financial stress in parents refers to stress related to additional financial needs due to children studying at home, which can include increased internet prices and the need to purchase computers/laptops for all children (Rodrigues et al., 2023). Few studies have investigated the impact of financial stress on the family (Conger et al., 1992; Kotchick et al., 2005; Masarik & Conger, 2017; McConnell et al., 2011; Oppermann et al., 2021). Many of these studies reported that financial stress can negatively impact parental experiences with online learning of their children (Frankel et al., 2023; Nurdin et al., 2022; Ponnet, 2014). However, these studies did not investigate whether financial stress may impact parental behavioral, emotional, and cognitive engagement (for analysis on these types of engagement, see Fredricks et al., 2004; Heinonen, 2017) with their children's online learning. Behavioral, emotional, and cognitive engagement refers to actions, feelings, and thoughts related to engagement with a certain activity, respectively (Fredricks et al., 2004).

Unlike financial stress, technical stress refers to the ability of parents to understand and operate online educational platforms to enable their children to effectively study online. In other words, technical stress can stem from problems with understanding hardware (internet or laptop) or software setups that are needed to enable students to study online. Technical stress has been reported in teachers during COVID-19 (Damicone, 2021; Garbe et al., 2020; Naufal, 2015).

Personal stress refers to general stress related to adjustment during and following the COVID-19 pandemic. Examples include adjustment to working from home, decreased socialisation, and health concerns about oneself and family members (Chung et al., 2023; Donker et al., 2021; Geprägs et al., 2023; Giannotti et al., 2022). It is predicted that personal stress may consume much of the parents' physical and mental resources, thus impacting their abilities to engage with their children's online learning. As discussed above, academic stress is related to awareness of pedagogical methods related to the children's education. However, to the best of our knowledge, this was not tested before in parents in relation to their online learning.

### *Caregivers' demographics*

In this section, we discuss prior studies on several demographical variables that may impact parental involvement with children's online learning, including gender, income level, employment type, number of enrolled children at school, and country of residence (Egypt vs. Arab Gulf).

Many studies have investigated how the gender of the parent is related to stress and their involvement with online learning. For example, Moreland-Russell et al. (2022) found that mother's mental health was impacted more by child's transition into online learning than fathers. Similar findings were also reported in other studies, showing that as mothers take more responsibilities and duties of their children's online learning, their mental health worsens and their stress increases (Lau, 2016; Lau et al., 2021; Lau & Ng, 2019).

As for caregiver's income and employment, there are some studies that have investigated their link to parental stress and wellbeing. For example, Moreland-Russell et al. (2022) found job loss of income during COVID-19 was associated with poor mental health. Furthermore, several studies found that the income of the parents is inversely related to their stress (Lee et al., 2007; Masha'al et al., 2020). Some other studies investigated other related to income, including educational level and socioeconomic status. It has been found that parental stress is also related to low educational attainment (Nasir et al., 2021; Rayce et al., 2020; Skreden et al., 2012) as well as low socioeconomic status (Li et al., 2021).

There are fewer studies on the relationship between caregiver's number of children enrolled at school and their stress. One study found that having fewer children is related to an increase in satisfaction in parents (Lau et al., 2021). However, this study did not investigate stress in parents, but it is expected that satisfaction would be inversely correlated with stress in parents. As for caregiver's country of residence, to the best of our knowledge, no study has investigated differences in parental stress due to children studying at home in different countries.

## Research objectives

To the best of our knowledge, prior studies have not investigated the impact of different types of stressors on parents in the context of online learning. As discussed above, there are different types of stressors including academic (AS), technical (TS), financial (FS), and personal stressors (PS). These types of stressors may influence parental involvement with their children during online learning differently. Furthermore, prior studies did not investigate the different types of parental engagements during online learning. There are three kinds of engagement including behavioral (BE), emotional (EE), and cognitive (CE) engagement.

The objectives of the current study are outlined as follows:

Objectives 1: Assess the impact of specific stressors – academic-related, technical, financial, and personal stress – on behavioral engagement;

Objectives 2: Assess the impact of specific stressors – academic-related, technical, financial, and personal stress – on emotional engagement;

Objectives 3: Assess the impact of specific stressors – academic-related, technical, financial, and personal stress – on cognitive engagement;

Objectives 4: Assess the impact of demographic variables, including age, gender, country of residence (Egypt vs. Arab Gulf), educational attainments, occupation, income, and the number of children enrolled in school and school type, the stress and engagement levels.

## Method

The current study utilized a quantitative approach using a survey questionnaire. The survey was completed by 729 individuals from various Arab Gulf countries. The questionnaire included 42 statements that were graded on a five-point Likert scale. For stress statements, 1 indicated not stressful at all, and 5 indicated very stressful. However, for engagement statements, 1 indicated strong disagreement and 5 indicated strong agreement. The questionnaire was distributed using Google Forms via messages sent to the participants. The questionnaire was divided into three sections. The first section included demographic information such as gender, age, gender, country of residence, qualification, occupation, and income. The second section included information about children such as the number of children enrolled in school as well as the children's type of school (private or governmental). The last section included statements about each construct. To our knowledge, as discussed above, there are no prior research studies considering the four distinct categories of stress experienced by parents when their children engage in online learning during the COVID-19 pandemic. Consequently, the scales employed to measure academic, technical, financial, and personal stress were influenced to some extent by existing literature, such as references (Wang & Eccles, 2012), but were predominantly developed specifically for this present study. The scale used to assess parental involvement in their children's online learning drew upon previous studies in the same domain but was modified to align with the context of this current investigation, as referenced in Fredricks et al. (2004) and Pilotti et al. (2017). The proposed questionnaire is provided in Supplementary Materials 1.

As previously stated, prior studies have not taken into account the different types of stress that parents face when their children are learning online. As a result, the scales used in the current study to assess academic, technical, financial, and personal stress were based on prior literature (Wang &

Eccles, 2012). The scale for parents' engagement in their children's online learning was guided by some previous research in the same area but was adjusted to be suitable for the current study (Fredricks et al., 2004; Pilotti et al., 2017).

## Statistical analysis and results

We applied the structural equation modeling (SEM) approach to quantitatively assess the relationships between parental stress and online learning engagement. The analysis followed the two-stage procedures as outlined by Anderson and Gerbing (1988). The initial stage involved a meticulous evaluation of the measurement model through confirmatory factor analysis (CFA), while the subsequent stage focused on assessing the structural equation model (SEM). Furthermore, we utilized MANOVA analysis to investigate the influence of demographic factors on both stress and online learning engagement scales. In cases where data were missing and accounted for less than 1 percent for each item, we adopted the mean replacement technique in accordance with Hair et al. (2017). This proposed analytical approach allowed us to comprehensively explore the relationships within the study's framework. We utilized IBM SPSS Statistics, version 27.0 (IBM Corporation in Armonk, NY, USA), along with AMOS statistical software by Arbuckle (2014) to evaluate the proposed SEM model.

## Participants

Data has been collected from 729 participants originating from a range of Arab countries, including Gulf nations and Egypt. Table 1 summarizes the demographic characteristics of the study's participants. It reveals a predominant presence within the 25–44 age range, with the 35–44 age group being the most represented at 36.3%. The data shows a significant female majority, comprising 72.90% of the participants. Participants are distributed between the Gulf region (58%) and Egypt (42%). In terms of educational background, a majority of participants hold a bachelor's degree (50.00%). Employment status encompasses a variety of roles, with students accounting for 35.60% and full-time employees for 30.20%. Income levels display diversity, with over half of the participants earning less than 1000 (55.10%), while 13.20% earn more than 5000. Family dynamics also differ, with the majority having one child in school (37.00%), and governmental schools being the preferred choice (69.50%).

## Confirmatory factor analysis

Based on the commonly utilized goodness-of-fit indices presented in Table 2, the results indicate a significant fit for the CFA model depicted in Figure 1. Typically recommended thresholds include values greater than 0.9 for goodness-of-fit index (GFI), comparative fit index (CFI), and normal fit index (NFI), as well as values exceeding 0.80 for adjusted goodness-of-fit index (AGFI), and values less than 0.08 for the root mean square error of approximation (RMSEA).

## Validity and reliability assessment

Table 3 provides a summary of the measurements of validity and reliability. We calculated Cronbach's alpha values, for all seven constructs of stress and engagement, the values approached or exceeded the threshold level of 0.7 (Hair et al., 2010), signifying the acceptability of measurement construct reliability. The results of confirmatory factor analysis (CFA) provided in Figure 1 demonstrated that all items were appropriately associated with their respective constructs, with factor loadings ranging from 0.612–0.878. On average, these factor loadings surpassed 0.70 for each construct. Moreover, results in Table 3 show that all constructs exceeded the recommended thresholds for composite reliability (CR) of 0.7, as well as the average variance extracted (AVE) of 0.5, in accordance

**Table 1.** Demographic characteristics of participants.

		Count	Percentage %
Age	Less 25	226	31.00%
	25–34	159	21.80%
	35–44	181	24.90%
	45–55	119	16.30%
	More than 55	43	5.90%
Gender	Male	197	27.10%
	Female	531	72.90%
Countries of residence	Gulf	422	57.89%
	Egypt	309	42.11%
Academic qualifications	Intermediate	32	4.40%
	Secondary	126	17.30%
	Diploma	103	14.10%
	Bachelor	364	50.00%
	Postgraduate	103	14.10%
Job types	Student	259	35.60%
	Full-time	220	30.20%
	Part-time	21	2.90%
	Freelance	68	9.30%
	Non-employee	160	22.00%
Income	Less than 1000	401	55.10%
	1000–1999	106	14.60%
	2000–2999	37	5.10%
	3000–3999	49	6.70%
	4000–4999	39	5.40%
Number of enrolled in school	More than 5000	96	13.20%
	1	269	37.00%
	2	193	26.50%
	3	138	19.00%
	4	128	17.60%
Type of school	Governmental	506	69.50%
	Private	222	30.50%

with the guidelines by Hair et al. (2017). Consequently, the measurements in this study exhibited convergent validity.

Factor scores were computed based on the established CFA model. Significant correlations were observed among all key dimensions ( $p < 0.05$ ). Additionally, in Table 3, the main diagonal represents the square root of average variances extracted, while the lower triangle displays the correlation coefficients. It's notable that the square root of average variances extracted for each construct surpasses the correlations coefficients in the lower triangle, indicating robust discriminant validity among the measures in this study.

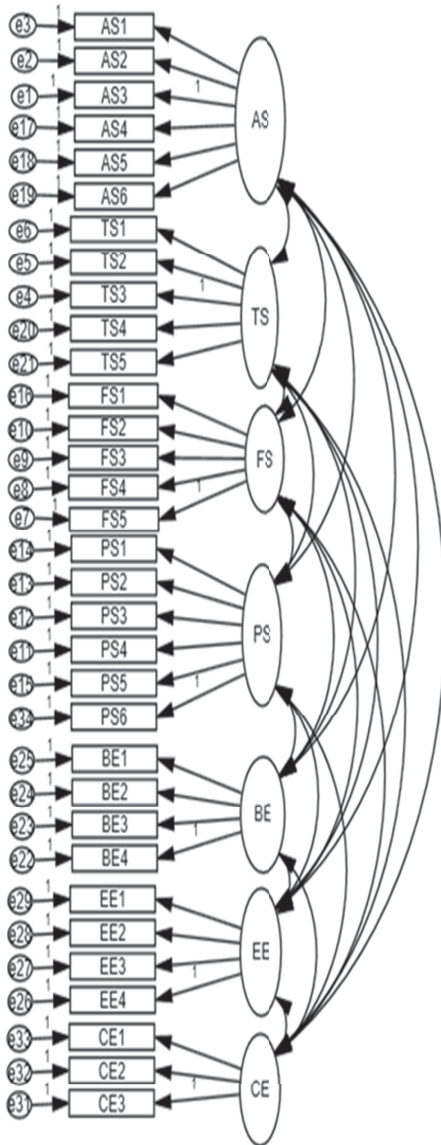
### Structural model and MANOVA analysis

All the goodness-of-fit criteria in Table 2 indicate that the presented structural model in Figure 2 fits the data well. The results of the structural model are detailed in Table 4. The study's results reveal several key relationships between different stress factors and engagement levels. Firstly, personal stress (PS) and academic stress (AS) emerge as influential factors, exerting a notable positive

**Table 2.** Model goodness of fit criteria.

Statistics	Suggested	Obtained for the measurement model	Obtained for the structural model
Chi-square significance	<0.05	0.00	0.00
Goodness of fit index (GFI)	<0.90	0.903	0.924
Adjusted goodness of fit index (AGFI)	<0.80	0.921	0.934
Comparative fit index (CFI)	<0.90	0.950	0.953
Normal fit index (NFI)	<0.90	0.943	0.913
Root mean square residuals (RMSEA)	>0.08	0.065	0.071





Indicator	Path direction	Factor	Regression Weight
AS1	<---	AS	0.792
AS2	<---	AS	0.799
AS3	<---	AS	0.742
AS4	<---	AS	0.86
AS5	<---	AS	0.84
AS6	<---	AS	0.823
FS1	<---	FS	0.785
FS2	<---	FS	0.804
FS3	<---	FS	0.612
FS4	<---	FS	0.666
FS5	<---	FS	0.772
PS1	<---	PS	0.772
PS2	<---	PS	0.71
PS3	<---	PS	0.685
PS4	<---	PS	0.74
PS5	<---	PS	0.65
PS6	<---	PS	0.7
TS1	<---	TS	0.794
TS2	<---	TS	0.79
TS3	<---	TS	0.757
TS4	<---	TS	0.767
TS5	<---	TS	0.675
CE1	<---	CE	0.756
CE2	<---	CE	0.705
CE3	<---	CE	0.796
EB1	<---	EB	0.85
EB2	<---	EB	0.673
EB3	<---	EB	0.788
EB4	<---	EB	0.834
EE1	<---	EE	0.857
EE2	<---	EE	0.878
EE3	<---	EE	0.869
EE4	<---	EE	0.771

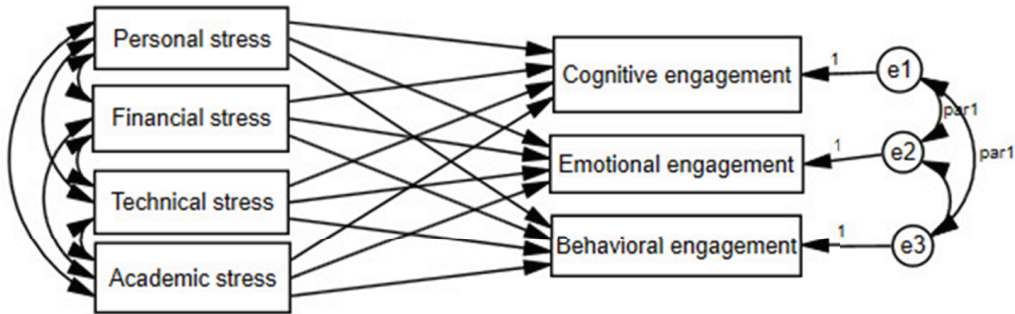
Figure 1. Model of confirmatory factor analysis (CFA) and standardized regression weights.

impact on various aspects of engagement, including emotional engagement (EE), cognitive engagement (CE), and behavioral engagement (BE). On the contrary, technical stress (TS) displays a distinct pattern, with a significant negative effect observed on engagement across these three dimensions. Notably, the data does not establish any significant effects of financial stress (FS) on the levels of engagement.

In Table 5, the results of the MANOVA analysis shed light on the factors associated with heightened levels of engagement, encompassing emotional engagement (EE), cognitive engagement (CE), and behavioral engagement (BE). Notably, the analysis reveals a significant connection

**Table 3.** Validity and reliability measurements and correlation coefficients.

	CR	AVE	MSV	MaxR(H)	EE	AS	TS	FS	PS	BE	EE
<b>EE</b>	0.909	0.714	0.527	0.914	<b>0.845</b>						
<b>AS</b>	0.920	0.656	0.493	0.923	0.308	<b>0.810</b>					
<b>TS</b>	0.871	0.574	0.530	0.875	0.135	0.652	<b>0.758</b>				
<b>FS</b>	0.851	0.535	0.530	0.863	0.196	0.619	0.728	<b>0.732</b>			
<b>PS</b>	0.859	0.505	0.504	0.863	0.332	0.702	0.710	0.708	<b>0.711</b>		
<b>EB</b>	0.868	0.623	0.543	0.880	0.726	0.308	0.160	0.195	0.346	<b>0.789</b>	
<b>CE</b>	0.797	0.567	0.543	0.802	0.717	0.368	0.201	0.240	0.380	0.737	<b>0.753</b>
<b>Cronbach's alpha coefficients</b>					0.870	0.725	0.836	0.723	0.835	0.897	0.732



**Figure 2.** Hypothesized structural model of parental stress on online learning engagement.

between genders, where females compared to males exhibit increased engagement across these dimensions. Additionally, the findings indicate that a rise in income is another factor linked to elevated levels of engagement.

The results presented in Table 6, stemming from the MANOVA analysis, provide insights into the demographic factors influencing stress levels. In particular, when comparing females to males, there is an observable rise in personal stress (PS). This trend also extends to individuals with a greater number of children enrolled in school, those who are not employed, and residents in Egypt comparing with the Gulf area. Furthermore, both financial stress (FS) and technical stress (TS) show significant associations with particular demographics. An increase in the number of children enrolled in school and residing in the Egypt compared to the Gulf area is linked to heightened levels of both FS and TS. Conversely, a decrease in income is associated with increased FS and TS. Additionally, an increase in academic stress (AS) is notably associated with an increase in the number of children enrolled in school and residency in Egypt compared to the Gulf area.

**Table 4.** Path coefficients for the structural model for the direct effects of parental stress on online learning engagement.

Dependent	Path direction	Independent	Estimate	S.E.	C.R.	P
CE	<—	PS	1.015	0.141	7.209	***
EE	<—	PS	1.289	0.199	6.463	***
BE	<—	PS	1.569	0.197	7.975	***
CE	<—	FS	0.01	0.088	0.112	0.911
EE	<—	FS	0.104	0.125	0.835	0.404
BE	<—	FS	-0.057	0.123	-0.461	0.645
CE	<—	TS	-0.39	0.084	-4.618	***
EE	<—	TS	-0.641	0.12	-5.358	***
BE	<—	TS	-0.527	0.118	-4.466	***
CE	<—	AS	0.188	0.039	4.779	***
EE	<—	AS	0.211	0.056	3.783	***
BE	<—	AS	0.183	0.055	3.337	***

**Table 5.** Impacts of demographic factors on cognitive engagement (CE), emotional engagement (EE), and behavioral engagement (BE).

Dependent variable	Independent variable	Parameter Estimates				95% Confidence interval	
		B	Std. error	t	Sig.	Lower bound	Upper bound
CE	Intercept	2.124	0.187	11.375	0	1.758	2.491
	Female vs males	0.15	0.066	2.262	0.024	0.02	0.281
	Income	0.04	0.016	2.422	0.016	0.008	0.072
EE	Female vs males	0.177	0.086	2.057	0.04	0.008	0.346
	Income	0.054	0.021	2.554	0.011	0.013	0.096
BE	Female vs males	0.209	0.094	2.236	0.026	0.025	0.393
	Income	0.052	0.023	2.257	0.024	0.007	0.098

## Discussion

Our results show that different types of stressors differently impact parents' behavioral, emotional, and cognitive engagement. Personal stress was found to positively impact all three types of engagement. Furthermore, personal stress was found to be related to number of children, employment status, and country of residence. However, academic stress was found to positively impact all three types of engagement. Furthermore, academic stress was found to be related to a number of children and country of residence. Technical stress was found to negatively impact all three types of engagement. Financial stress was found to have no effect on all three types of engagement. Furthermore, both technical and financial stressors were found to be related to income, number of children, and country of residence. This builds on prior study (Abo Hamza & Elsantil, 2023) and further addresses additional variables, such as country of residence. As shown in our results, country of residence. Finally, gender and income were found to be related all three types of engagement.

Our results regarding the impact of demographical variables, including gender, income, and number of children on stress and engagement are as predicted and are also in agreement with prior studies. Like our findings, several prior studies found that mothers are impacted more by transition into online learning of their children than fathers (Lau, 2016; Lau et al., 2021; Lau & Ng, 2019; Moreland-Russell et al., 2022). This is most likely the case, as mothers spend more time with their children and often bear bigger responsibilities regarding their educational attainment and also experience more stress than mothers with supportive partners (Milkie et al., 2002). However, future research should investigate whether differences in the ratio of childrearing responsibilities

**Table 6.** Impacts of demographic factors on personal stress (PS), academic stress (AS), technical stress (TS), and financial stress (FS).

Dependent variable	Independent variable	B	Std. error	t	Sig.	95% Confidence interval	
						LL	UP
PS	Intercept	0.889	0.093	9.593	<0.005	0.707	1.071
	Female vs males	0.098	0.033	2.978	0.003	0.033	0.163
	Job type	0.023	0.01	2.314	0.021	0.004	0.043
	Number of children	0.052	0.012	4.164	<0.005	0.027	0.076
FS	Intercept	2.002	0.192	10.419	<0.005	1.625	2.379
	Gulf vs Egypt	-0.06	0.019	-3.223	0.001	-0.097	-0.024
	Income	-0.046	0.017	-2.712	0.007	-0.079	-0.013
	Number of children	0.071	0.026	2.756	0.006	0.02	0.122
TS	Intercept	2.232	0.19	11.764	<0.005	1.86	2.605
	Gulf vs Egypt	-0.063	0.019	-3.395	0.001	-0.099	-0.027
	Income	-0.049	0.017	-2.92	0.004	-0.081	-0.016
	Number of children	0.065	0.025	2.549	0.011	0.015	0.115
AS	Intercept	2.254	0.262	8.594	<0.005	1.739	2.769
	Gulf vs Egypt	-0.091	0.026	-3.55	<0.005	-0.141	-0.041
	Number of children	0.117	0.035	3.324	0.001	0.048	0.186

among fathers and mothers in different individuals, families, cultures, and countries are related to differences in stress levels. It is predicted that mothers in societies or in households that give them more childrearing responsibilities may report more stress during online learning of their children.

Our results are also in agreement with prior studies on the impact of parents' income on stress and engagement with online learning (Lee et al., 2007; Li et al., 2021; Masha'al et al., 2020; Moreland-Russell et al., 2022; Nasir et al., 2021; Rayce et al., 2020; Skreden et al., 2012). This is possibly the case as online learning may require every childhood to have their computer or laptop, which can then increase financial stress on the parents. In many parts of the world, internet use is very limited, and purchasing additional internet quota can be very expensive on low-income families.

Our results are also in agreement with prior studies on the impact of number of children on parental satisfaction and stress (Lau et al., 2021). It is very likely that parental stress is higher in relation to having more children, as during COVID-19, all children will require additional material as well as desk space and computers for their studies. Failure or difficulty to meet these requirements will increase stress in the parents.

As for cultural aspects, there are few studies on conducted in Eastern and Arab countries regarding the experiences of parents due to online learning of their children. For example, Like Alharthi (2023), we also found that the transition to online learning increases the burden in many parents. We have extended these findings and additionally showed that different kinds of stress levels also increased in the parents due to the transition to online learning of their children. However, surprisingly, we found that financial stress was found to have no effect on all three types of engagement. This is different from the results of Aladsani (2022), who reported financial stress in the parents. Our findings, however, on academic stress are in line with findings from Aladsani (2022) who showed that parents also show academic stress during the transition to online learning of their children. Furthermore, as discussed in the Introduction on studies conducted in Indonesia, these studies show that many parents show that there is a mixed opinion on online learning for their children (Jamilah & Fahyuni, 2022; Nasir et al., 2021) and that parents value online education positively if teachers, parents, school staff, and government are involved and supporting educational programs (Jumareng et al., 2022). In summary, it seems that many in Eastern and Arabic cultures prefer in person learning of their children. However, if online learning is a must due to pandemics or other conditions, parents prefer to be consulted throughout the process. Future work should compare views of Western vs. Eastern parents regarding online learning of their children. It is predicted that parents in Eastern and Arab cultures may prefer face to face learning more than parents in Western cultures. This is related to many Eastern and Arab cultures are more collectivist than most Western cultures.

### ***Limitations and future studies***

In this section, we discuss limitations as well as future studies that build on current results.

One limitation of the current study is we treated behavioral, emotional, and cognitive engagement separately. However, prior studies have shown that these types of engagement are interrelated (Li & Lerner, 2013). Accordingly, future work should investigate the relationship among all types of engagement in students, teachers, and parents.

Future research should investigate individual differences in experiencing stress in parents due to the transition to online learning of children. For example, Wang et al. (2023) found that the readiness to study online and emotional competence were associated with successful transition to studying online during COVID-19 in both high school and university students. Future work should use these measures and investigate readiness to study online in parents of students as well as teachers. It is expected that parents and caregivers who score high on the readiness to study online learning questionnaire would be able to support their children during online learning as well as score high on behavioral, emotional, and cognitive engagement.

One recent study highlighted the importance of strengthening teacher–parent relationships and interactions in order to improve the experience of online learning for the children (Schuck et al., 2023). Other studies found that parent-teacher interaction is a key for successful online learning (Francis et al., 2022; Sanders & Sheldon, 2009). Future research should explore how teachers and parents (or caregivers) interact during online learning of the students. In addition, future research should also explore whether positive interactions among teachers and parents can mediate successful online learning of the students. Furthermore, like Gupta et al. (2022), future work should investigate stress and engagement in students, teachers, and parents. It is expected that stress and engagement expressed by teachers and parents may impact stress and engagement of the students. In a review study, Abdullah et al. (2022) found that teachers' support for the students matters more for students' learning experience than parents' support. This is possibly due to teachers being more trained to address online learning issues than parents. Future work should explore how teachers' vs. parents' support, stress, or motivation impact the students' engagement with online learning.

Future work should also investigate parental stress and engagement in relation to the type of online learning activities. For example, Sujarwo et al. (2022) found that parents' involvement and motivation during online learning for their children are related to online class activities. Specifically, they found parents were more involved and motivated if class activities included engaging video tutorials.

Future research should also explore whether online learning and impact on parents or caregivers is applicable to children with special needs. One review study reported that students with special needs may face more challenges working with technology or new educational platforms during online learning (Aljedaani et al., 2023). This, in turn, could lead to an increase in parental involvement and stress.

The implications of our findings are as follows. Department of Higher Education and schools should support parents and caregivers in order for them to be able to help their children during online learning. As reported above, many in Eastern cultures prefer face-to-face education. For example, Zheng et al. (2022) found that students in Hong Kong prefer face-to-face education than online learning. Alternatively, if online learning is a must, parents should be consulted regarding their role in educating their children. In China, it was found that parents play a key role in details regarding the online education of their children (Liu et al., 2022). Accordingly, schools and educational government offices should develop policies to engage parents and caregivers in the decision-making process related to the type of educational platforms used for online learning, the type of assessments to be done online, as well as the exact role of parents in online education. Importantly, stress management techniques, including guidelines and additional material should be provided to parents in order to manage their personal, academic, and technical stress.

## Conclusions

Our study is the first to investigate how different types of stressors in parents may impact their engagement with online learning of their children. We found that different types of stressors impact engagement differently. Our findings have implications for the management of parental stress and thus for effective and successful online learning for students. An et al. (2022) found that online learning can be successful if involved parties take into consideration the wellness of students as well as the support provided to students at home. Future research should investigate the stress of students, teachers and parents impacted by online learning, and aim to provide support to manage their stress.

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