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INSTITUTO DE CIÊNCIAS BIOLÓGICAS E DA SAÚDE
PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS DA SAÚDE

MIRELLA PRISCILLA DOS SANTOS VIEIRA

AUMENTO DO RISCO DE SINTOMAS ASSOCIADOS AOS TRANSTORNOS ANSIOSOS E DEPRESSIVOS EM FIGURAS PARENTAIS DURANTE O ENSINO REMOTO EMERGENCIAL NA PANDEMIA DA COVID-19

MACEIÓ – AL
2023

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Dissertação apresentada ao Programa de Pós-Graduação em Ciências da Saúde (PPGCS) da Universidade Federal de Alagoas (UFAL), em cumprimento às exigências para a obtenção do título de Mestre em Ciências da Saúde.
Orientador: Prof. Dr. Marcelo Duzzioni
Coorientador: Prof. Dr. Wagner Silva Ribeiro

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Dissertação submetida ao corpo docente do Programa de Pós-Graduação em Ciências da Saúde da Universidade Federal de Alagoas e aprovada em 28 de fevereiro de 2023.

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Dedico à minha flor,

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RESUMO

As medidas de confinamento social decorrentes das políticas públicas de saúde durante a pandemia de SARS-CoV-2 trouxeram profundas alterações ao cotidiano das pessoas e à dinâmica familiar. O fechamento das escolas e a implementação do ensino remoto emergencial (ERE) contribuíram para a deterioração da saúde mental, intensificando o estresse e aumentando os sintomas associados aos transtornos de ansiedade e depressão, principalmente nos pais. Nesse contexto, avaliamos se as responsabilidades dos pais em relação ao ERE durante a pandemia do SARS-CoV-2 são um fator de risco para sintomas associados aos transtornos de ansiedade e depressão. Para isso, realizamos uma pesquisa transversal online utilizando uma amostra de conveniência de pais/responsáveis por filhos em ERE residentes na cidade de Maceió, estado de Alagoas (Brasil). Os participantes preencheram um questionário de três seções, que incluía informações demográficas, conhecimento e tempo gasto com foco na COVID-19 e um autorrelato de sintomas associados à ansiedade [General Anxiety Disorder-7 (GAD-7)] e depressão [Patient Health Questionnaire-9 (PHQ-9)]. Modelos de regressão logística multivariada foram realizados para explorar o papel do ERE como um potencial preditor de ansiedade e depressão, controlando possíveis fatores de confusão. Nossos resultados mostram que em nossa amostra populacional 23,41% e 21,1% dos participantes apresentavam sintomas de ansiedade e depressão, respectivamente. Além disso, mesmo após controlar possíveis fatores de confusão, a responsabilidade de auxiliar no ERE foi identificada como fator de risco para ansiedade (OR = 2,54; IC = 1,13-5,68; p= 0,023) e depressão (OR = 3.45; IC = 1,36-8,70; p= 0,009), embora fatores de proteção estivessem presentes. Esses fatores de proteção incluíram renda superior a 3 salários-mínimos em 67,53% dos participantes e nível superior (incompleto/completo) em 94,25% dos participantes. Além disso, o recebimento de auxílio financeiro emergencial (R$ 600,00, que corresponde à 57,41% do salário-mínimo) foi identificado como fator de proteção contra o desenvolvimento de sintomas de transtornos depressivo (OR = 0,34; IC = 0,17-0,70; p= 0,004). Nossos resultados mostram que a saúde mental dos pais é afetada pelas mudanças no ambiente familiar provocadas pela COVID-19 e destacam a importância de políticas sociais emergenciais e de atendimento psicológico a esse grupo.

Palavras-chave: síndrome respiratória aguda grave; coronavírus 2; privação social; fechamento das escolas; ensino remoto emergencial; auxílio financeiro emergencial; transtornos de ansiedade; transtornos de depressão.

ABSTRACT

Social confinement measures due to public health policies during the SARS-CoV-2 pandemic brought profound changes to people's daily routines and to the family dynamic. School closings and the implementation of emergency remote teaching (ERT) contributed to mental health deterioration by intensifying stress and increasing symptoms associated with anxiety and depressive disorders, particularly in parents. In this context, we assessed whether parental responsibilities to ERT during the SARS-CoV-2 pandemic are a risk factor for symptoms associated with anxiety and depressive disorders. For this, we conducted an online cross-sectional survey using a convenience sample of parents in charge of children undergoing ERT that reside in the city of Maceió, state of Alagoas (Brazil). The participants completed a three-section questionnaire, which included demographic information, knowledge and time spent focusing on COVID-19, and a self-report of symptoms associated with anxiety [General Anxiety Disorder-7 (GAD-7)], and depression [Patient Health Questionnaire-9 (PHQ-9)]. Multivariate logistic regression models were performed to explore the role of ERT as a potential predictor of anxiety and depression, controlling for potential confounders. Our results show that in our population sample 23.41% and 21.1% participants had symptoms of anxiety and depression, respectively. Furthermore, even after controlling for potential confounders, the responsibility of assisting in ERT was identified as a risk factor for anxiety (OR = 2.54; CI = 1.13,5.68; p= 0.023) and depression (OR = 3,45; IC = 1.36,8.70; p= 0.009), even though, protective factors were present. These protective factors included an income higher than 3 minimum wages in 67.53% of the participants and a college/university degree in 94.25%. Moreover, receiving emergency financial aid [BRL 600.00 (USD 105.07), corresponding to 57.41% of the minimum Brazilian wage] was identified as a protective factor against developing depressive symptoms (OR = 0.34; IC = 0.17,0.70; p= 0.004). Our results show that the parents' mental health is affected by changes in the household brought on by COVID-19 and highlights the importance of emergency social policies and psychological assistance in this group.

Keywords: severe acute respiratory syndrome; coronavirus 2; social deprivation; school closure; emergency remote teaching; financial emergency aid, anxiety disorder, depression disorder

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LISTA DE ABREVIATURAS E SIGLAS

Artigo de resultados – Increased risk of symptoms associated with anxiety and depressive disorders in parents during the emergency remote teaching in COVID-19 pandemic.

Approx.	Approximately
BRL	Brazilian Real
COVID-19	Corona Virus Disease 2019
ERT	Emergency Remote Teaching
GAD-7	Generalized Anxiety Disorder-7
MERS	Middle East Respiratory Syndrome
PHQ-9	Patient Health Questionnaire-9
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
USD	United States Dollar

SUMÁRIO

1 INTRODUÇÃO

Os transtornos de ansiedade e depressão constituem um grave problema de saúde pública, devido as suas prevalências, estigmas associados e lacunas de atenção à saúde mental. Além disso, estes transtornos estão relacionados a um custo e impacto substanciais nos indivíduos e na sociedade (CHRISTENSEN et al., 2020; JAVED et al., 2021; PATHARE; BRAZINOVA; LEVAV, 2018; REHM; SHIELD, 2019). Ambas as patologias são comorbidades que interferem e causam prejuízos no funcionamento físico, cognitivo, comportamental, afetivo e social (MALHI; MANN, 2018; PENNINX et al., 2021) e compartilham uma ampla gama de fatores de risco, *e.g.*, estressores ambientais (BLANCO et al., 2014; SMOLLER, 2016).

Exposições a eventos estressantes ao longo da vida, como ocorrem durante epidemias e pandemias, podem contribuir para o aumento da prevalência dos transtornos de ansiedade e depressão (BUSCH et al., 2021; SERRANO-RIPOLL et al., 2020). Estudos demostraram que surtos epidêmicos virais de outros betacoronavírus, os da Síndrome Respiratória Aguda Grave (*SARS*, do inglês *Severe Acute Respiratory Syndrome*) e da Síndrome Respiratória do Oriente Médio (*MERS*, do inglês *Middle East Respiratory Syndrome*), desencadearam efeitos negativos, *e.g.*, ansiedade e depressão, que afetaram a saúde e o bem-estar dos indivíduos que estavam atuando na linha de frente contra os vírus, tanto dos que sobreviveram a infecção viral, quanto dos que permaneceram em quarentena e isolados (HAWRYLUCK et al., 2004; JEONG et al., 2016; MCALONAN et al., 2007; SEONG et al., 2021). Esses efeitos foram vistos durante o enfrentamento dos surtos epidemiológicos, assim como, a longo prazo (AHMED et al., 2020; ROGERS et al., 2020). Tal qual as duas epidemias supracitadas, estudos demonstram que a pandemia do novo coronavírus (*SARS-CoV-2*, do inglês *Severe Acute Respiratory Syndrome Coronavirus 2*) impactou negativamente a saúde mental pública (CÉNAT et al., 2021; WU et al., 2021).

As incertezas quanto a duração da pandemia, o medo da infecção, informações inadequadas/imprecisas, insegurança financeira e as medidas de bloqueio de contato afetou negativamente a saúde mental da população (CASTALDELLI-MAIA et al., 2021; MANCHIA et al., 2022; RODRÍGUEZ-FERNÁNDEZ et al., 2021). Diante das medidas de restrição de contato físico ou social, como o fechamento das escolas e a implementação do regime de ensino remoto emergencial (ERE) e do trabalho em casa, os pais foram um dos grupos mais afetados pela COVID-19. De fato, conciliar as demandas profissionais com o cuidado e a participação

ativa na educação formal dos filhos aumentou a carga de trabalho, e por sua vez, contribuiu com a deterioração da saúde mental dos pais (MISIRLI; ERGULEC, 2021). No entanto, poucos estudos têm focado em avaliar a saúde mental dos pais e cuidadores diante das responsabilidades educacionais impostas pela pandemia da COVID-19. Diante desse contexto, esse trabalho parte da hipótese que a responsabilidade e preocupação pela educação dos filhos/dependentes durante o ERE na pandemia de COVID-19 constitui um fator de risco para o desenvolvimento de ansiedade e depressão.

2 OBJETIVOS GERAL E ESPECÍFICOS

Avaliar o papel dos novos desafios decorrentes do ensino remoto emergencial (ERE) durante a pandemia de COVID-19 como potencial fator de risco para o desenvolvimento de ansiedade e depressão em pais/responsáveis de alunos submetidos a essa estratégia didática e pedagógica na cidade de Maceió, estado de Alagoas (Brasil).

3 ARTIGO

Increased risk of symptoms associated with anxiety and depressive disorders in parents during the emergency remote teaching in COVID-19 pandemic

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Conflict of interest

The authors declare no conflict of interest

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Abstract

Social confinement measures due to public health policies during the SARS-CoV-2 pandemic brought profound changes to people's daily routines and to the family dynamic. School closings and the implementation of emergency remote teaching (ERT) contributed to mental health deterioration by intensifying stress and increasing symptoms associated with anxiety and depressive disorders, particularly in parents. In this context, we assessed whether parental responsibilities to ERT during the SARS-CoV-2 pandemic are a risk factor for symptoms associated with anxiety and depressive disorders. For this, we conducted an online cross-sectional survey using a convenience sample of parents in charge of children undergoing ERT that reside in the city of Maceió, state of Alagoas (Brazil). The participants completed a three-section questionnaire, which included demographic information, knowledge and time spent focusing on COVID-19, and a self-report of symptoms associated with anxiety [General Anxiety Disorder-7 (GAD-7)], and depression [Patient Health Questionnaire-9 (PHQ-9)]. Multivariate logistic regression models were performed to explore the role of ERT as a potential predictor of anxiety and depression, controlling for potential confounders. Our results show that in our population sample 23.41% and 21.1% participants had symptoms of anxiety and

depression, respectively. Furthermore, even after controlling for potential confounders, the responsibility of assisting in ERT was identified as a risk factor for anxiety (OR = 2.54; CI = 1.13,5.68; p= 0.023) and depression (OR = 3,45; IC = 1.36,8.70; p= 0.009), even though, protective factors were present. These protective factors included an income higher than 3 minimum wages in 67.53% of the participants and a college/university degree in 94.25%. Moreover, receiving emergency financial aid [BRL 600.00 (USD 105.07), corresponding to 57.41% of the minimum Brazilian wage] was identified as a protective factor against developing depressive symptoms (OR = 0.34; IC = 0.17,0.70; p= 0.004). Our results show that the parents' mental health is affected by changes in the household brought on by COVID-19 and highlights the importance of emergency social policies and psychological assistance in this group.

Keywords: severe acute respiratory syndrome; coronavirus 2; social deprivation; school closure; emergency remote teaching; financial emergency aid, anxiety disorder, depression disorder

1 INTRODUCTION

In March 2020, the World Health Organization declared a pandemic due to the worldwide spread of the highly contagious SARS-CoV-2 (WHO, 2020). In response, large-scale government anti-contagion policies were activated to mitigate and suppress viral transmission (CHUNG et al., 2021; HALE et al., 2021). While these actions slowed the coronavirus spread, they also had a negative impact on society's mental health. Restricting populations to their homes, closing schools, and imposing work-at-home regimes, among other measures, have induced symptoms compatible with anxiety and depressive disorders (CASTALDELLI-MAIA et al., 2021; MANCHIA et al., 2022; RODRÍGUEZ-FERNÁNDEZ et al., 2021).

Both, anxiety and depression are serious public health concerns (WHO, 2017) that share various risk factors, including environmental stressors, such as those experienced during epidemics and pandemics (SMOLLER, 2016). Indeed, studies show during two previous epidemics by betacoronavirus, the Severe Acute Respiratory Syndrome (SARS) and the Middle East Respiratory Syndrome (MERS), there was a negative short- and long-term impact on the psychological health and well-being of individuals that survived infection, were quarantined and isolated, or were in the frontline against these viruses (AHMED et al., 2020;

HAWRYLUCK et al., 2004; JEONG et al., 2016; MCALONAN et al., 2007; SEONG et al., 2021). Similar, the negative impact of the SARS-CoV-2 pandemic on the mental health of the general population and frontline workers has been extensively researched (CÉNAT et al., 2021; WU et al., 2021).

Within the general population, parents have experienced significant changes in their personal and household routines and organization (CLUVER et al., 2020). School closures and the implementation of emergency remote teaching (ERT) have caught parents unprepared and increased their workload by fusing their professional demands with a prominent role in their children's formal education (MISIRLI; ERGULEC, 2021). These factors and the sudden onset of the pandemic, fear of infection, confinement measures, financial insecurity, domestic responsibilities, and childcare, constitute cumulative stressors that weaken mental health (KIRA et al., 2021).

Thus, we hypothesize that the prevalence of anxiety and depression will be higher among parents who are concerned about/are responsible for their children ERT, as compared to parents who are not, even when confounders are take into consideration.

2 METHODS

2.1 Study design and ethical statements

We conducted a cross-sectional study to assess whether responsibility and concerns for children's schooling in ERT during SARS-CoV-2 isolation policies affects the mental health of parents. The study was conducted in the city of Maceió, state of Alagoas (Brazil) and included a non-probability convenience sample of parents (parents / caregivers). The study was approved by the Ethics Committee of the Federal University of Alagoas, Brazil (CAAE: 33845320.7.0000.5013). Electronic informed consent was obtained from each participant before the research began, and those who did not provide consent were excluded from further participation. Furthermore, participants could remove themselves from the study at any moment without providing a justification.

2.2 Participants

Participants were recruited through a non-probability convenience sample five months after Decree No. 69527/2020, and Ordinance No. 4904/2020, both from the Government of the

state of Alagoas (Brazil). The first suspended all educational activities in public and private schools, colleges, and universities as of March 23, 2020, and the second regulated the substitution of presential for non-presential school activities, as of June 18, 2020, in the state of Alagoas.

The eligibility criteria of participants included parents who provided informed consent, were between 18 and 70 years old, and living in the city of Maceió, state of Alagoas (Brazil). A total of 438 participants completed the questionnaires; from which, 348 were considered valid for analysis. The exclusion of 89 questionnaires was due to the participants no having children in charge, and one additional questionnaire was excluded due to the participant's underage.

2.3 Procedure

Participants were recruited by convenience and anonymously replied to the questionnaires via Google Forms® from August 20th, 2020, to October 31st, 2020. A brief description of the survey was provided, and the questionnaire was divided into three sections: the first collected the participants' demographic data, knowledge and time spent focusing on COVID-19, and how the pandemic affected their lives. The second addressed their self-reported anxiety, and the third addressed their self-reported depression disorder. The survey was emailed to public and private educational institutions, including universities, high schools, middle schools, primary schools, and pre-schools of the city of Maceió. Moreover, we requested that students, parents, and educational workers share information regarding enrollment in this study. Lastly, the survey was also shared on social platforms (WhatsApp, Facebook, Instagram, and Twitter).

2.4 Measured variables

2.4.1 Demographic characteristics:

Demographic variables included gender (male or female), age, marital status, education, occupation, family income, and number of children. Occupation included the following three categories: (1) healthcare workers; (2) teachers or students; and (3) others.

2.4.2 COVID-19 related variables:

(a) Receiving government financial emergency aid;
(b) Impact of the pandemic on employment, regarding four categories: (1) home-office, (2) frontline worker, (3) unemployment, or (4) job loss;
(c) Time spent reading, listening, or watching news in search for information about the pandemic;
(d) Knowledge about the SARS-CoV-2, which was assessed by the following eight judgment questions:
    i. Viral transmission can be caused by inhaling droplets from a sneezing, coughing, and/or talking to an infected person;
    ii. Viral transmission can be caused by contact with a 'contaminated' object from an infected person;
    iii. Contact with an asymptomatic person can lead to infection;
    iv. SARS-CoV-2 can be cured with existing targeted drugs;
    v. Taking hydroxychloroquine or chloroquine can prevent infection;
    vi. Taking ivermectin can prevent infection;
    vii. The use of alcohol 70% or bleach helps disinfect objects and surfaces;
    viii. If a person in the household is diagnosed positive, all the residents should also isolate for 14 days.

Of the eight questions above, one point was given for each correct answer, and null points for each incorrect answer.

2.4.3 Generalized anxiety and depressive disorders assessment

To assess the participants' anxiety symptoms, we used the Brazilian-Portuguese version of the Generalized Anxiety Disorder-7 (GAD-7) scale. This is a widely used and well-validated diagnostic tool (KROENKE et al., 2007; SPITZER et al., 2006), translated into Brazilian-Portuguese (Copyright© 2005 Pfizer Inc., New York, NY), and previously used on Brazilian populations (Cronbach's alpha= 0.916) (MORENO et al., 2016). The seven-items of the scale are self-reported and assess anxiety symptoms' frequency over the past two weeks on a 4-point Likert-scale. The scale ranges from "0" (not at all), "1" (several days), "2" (more than half of the days), to "3" (nearly every day). The GAD-7 scale total score ranges from 0 to 21, with

increasing scores that reflect increasing severe functional impairments (SPITZER et al., 2006). We defined a GAD score of 10 points or higher as a probable anxiety disorder.

To identify symptoms related to depressive disorders, we used the Brazilian-Portuguese version of the Patient Health Questionnaire-9 (PHQ-9) scale. This is a validated 9-item self-reported questionnaire (SPITZER et al., 1999; KROENKE et al., 2001), translated into Brazilian-Portuguese (Copyright© 2005 Pfizer Inc., New York, NY), and previously used on the Brazilian population (OSÓRIO et al., 2009; SANTOS et al., 2013). The questionnaire is a depressive module that scores each of the 9 DSM-IV criteria as "0" (not at all), "1" (several days), "2" (more than half of the days), to "3" (nearly every day), and its score ranges from 0 to 27. We defined a PHQ score of 10 points or higher as a likely depressive disorder. Both, the PHQ-9 and GAD-7 questionnaires are available online (https://www.phqscreeners.com/select-screener).

2.5 Statistical analysis

We first conducted a descriptive analysis of demographic, clinical characteristics, and knowledge related to SARS-CoV-2. Categorical variables were described based on the frequency of responses and proportions in each category and continuous variables were described based on measures of central tendency (means, M) and dispersion (standard deviation, SD). We then performed, two multivariate logistic regression models to explore the role of ERT as a potential predictor of anxiety and depression, controlling for potential confounders and using the Backward Wald method. For the first model, we defined anxiety disorder as the dependent variable, and for the second model depressive disorder was defined as the dependent variable. The variables were computed based on the GAD-7 and PHQ-9 scores and their respective cut-points previously described. All variables were dichotomized to further explore their effects using regression models. The data were analyzed using the SPSS version 25. The Odds ratio (OR) and its 95% confidence interval (95% CI) were calculated. In terms of OR's effect size, < 1.5 was considered as trivial, 1.5 as small, 3.5 as medium, and, 9.0 as large (GOSS-SAMPSON, 2022). A significance level of $P < 0.05$ was assumed. A Sankey diagram was performed using RAWGraphs 2.0 beta to visualize the correlation between risk variables.

3 RESULTS

Our study population is mainly composed of women (77.87%) and married individuals (81.32%), with an overall higher-education level (94.25%) who attained a college or university degree, and a family income above 3-minimum wages [USD 550.00/month (67.53%)]. Additionally, more than half of the participants held a home-office regime (52.87%), and the majority informed responsibilities related to their children's formal education (82.18%). Overall, nearly two in five people reported preexisting mental health disorders before the pandemic, and the prevalence of symptoms related to anxiety and depression was 23.41% and 21.10%, respectively (Table 1).

Table 1. Demographic characteristics and knowledge related to COVID-19 among 348 participants

	M	SD	Min	Max	n	%
Gender						
Female					271	77.87
Male					76	21.84
Not reported					1	0.29
Age	39.7	7.41	20	68		
Marital status						
Single					41	11.78
Married					283	81.32
Divorced/Widowed					24	6.90
Education						
Primary/Secondary					20	5.75
College/University					328	94.25
Occupational sector						
Education					147	42.24
Health					68	19.54
Other					133	38.22
Family income*						
≤ 1 minimum wage					34	9.77
1-2 minimum wages					41	11.78
2-3 minimum wages					38	10.92
> 3 minimum wages					235	67.53
Financial emergency aid#						
No					298	85.63
Yes					50	14.37
Number of children						
1					159	45.69
2					152	43.68
3					37	10.63
Children in need of help with ERT						
No					62	17.82
Yes					286	82.18

	M	SD	Min	Max	n	%
Previous mental disorders						
No					216	62.07
Yes					132	37.93
COVID-19 effect on occupation						
Home-office					184	52.87
Frontline worker					116	33.33
Unemployed					38	10.92
Job loss					10	2.87
Searching for news on COVID-19						
< 1 hour					249	71.55
1-2 hours					77	22.13
> 2 hours					22	6.32
COVID-19 knowledge	7.27	1.05	2	8		
Probable anxiety disorder (GAD-7)						
No					265	76.59
Yes					81	23.41
Probable depressive disorder (PHQ-9)						
No					273	78.90
Yes					73	21.10

Abbreviations: M, mean; SD, standard deviation; Min, minimum; Max, maximum; n, number; COVID-19, 2019 Coronavirus Disease; GAD-7, General Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9. *Minimum wage per month in 2020: BRL 1,045.00 (USD 183.01). #Financial emergency aid: BRL 600.00/month (USD 105.07/month).

Even after controlling for potential confounders, parents who had children in need of help with ERT were associated with two-times higher risk of developing symptoms of anxiety disorders, with a moderate size effect ranging from small to medium. Additionally, belonging to the educational sector as a worker or student during ERT were also considered a risk factor for developing anxious symptoms. The proposed model explains 10% of the probable anxiety disorders in our sample, as indicated by Cox & Snell, and 16% as indicated by Nagelkerke (Table 2). Furthermore, we represented the risk variables relationship with probable anxiety disorder using a Sankey diagram (Figure 1.A).

Table 2. GAD-7 multivariate regression logistic analysis

Independent variables	**OR**	**P**	**95% CI**
Children in need of help with school activities	2.54	**.023**	[1.13, 5.68]
Occupational sector (education)	2.51	**.001**	[1.46, 4.32]
Marital status (single)	2.06	**.035**	[1.05, 4.05]
Family income*	0.53	.073	[0.25, 1.06]
Financial emergency aid#	0.47	.068	[0.21, 1.05]
Previous diagnoses of mental health disorders	2.80	**.000**	[1.64, 4.76]
		(Cox & Snell) r^2	0.10
		(Nagelkerke) r^2	0.16

Abbreviations: OR, odds ratio; CI, confidence interval. *Minimum wage per month in 2019: BRL 1.045,00 (USD 183.01). #Financial emergency aid: BRL 600.00/month (USD 105,07/month).

When we analyzed data on probable depressive disorders, as measured by the PHQ-9, parents who had children in need of help with ERT were associated with three-fold increased risk of developing symptoms of anxiety with a moderate size effect ranging from small to medium, even after controlling for potential confounders. Furthermore, receiving financial emergency aid acted as a protective factor. This proposed model explains 14% of the probable depressive disorders in our sample, as indicated by Cox & Snell, and 22% as indicated by Nagelkerke (Table 3). We further explored the relationship of the risk variables with probable depressive disorder using a Sankey diagram (Figure1.B).

Table 3. PHQ-9 multivariate regression logistic analysis

Independent variables	**OR**	**P**	**95% CI**
Children in need of help with school activities	3.45	**.009**	[1.36, 8.70]
Frontline worker	0.56	.076	[0.29, 1.06]
Marital status (single)	2.26	**.016**	[1.16, 4.40]
Financial emergency aid	0.34	**.004**	[0.17, 0.70]
Previous diagnose of mental health disorders	4.36	**.000**	[2.44, 7.77]
		(Cox & Snell) r^2	0.14
		(Nagelkerke) r^2	0.22

Abbreviations: OR, odds ratio; CI, confidence interval. #Financial emergency aid: BRL 600.00/month (USD 105,07/month).

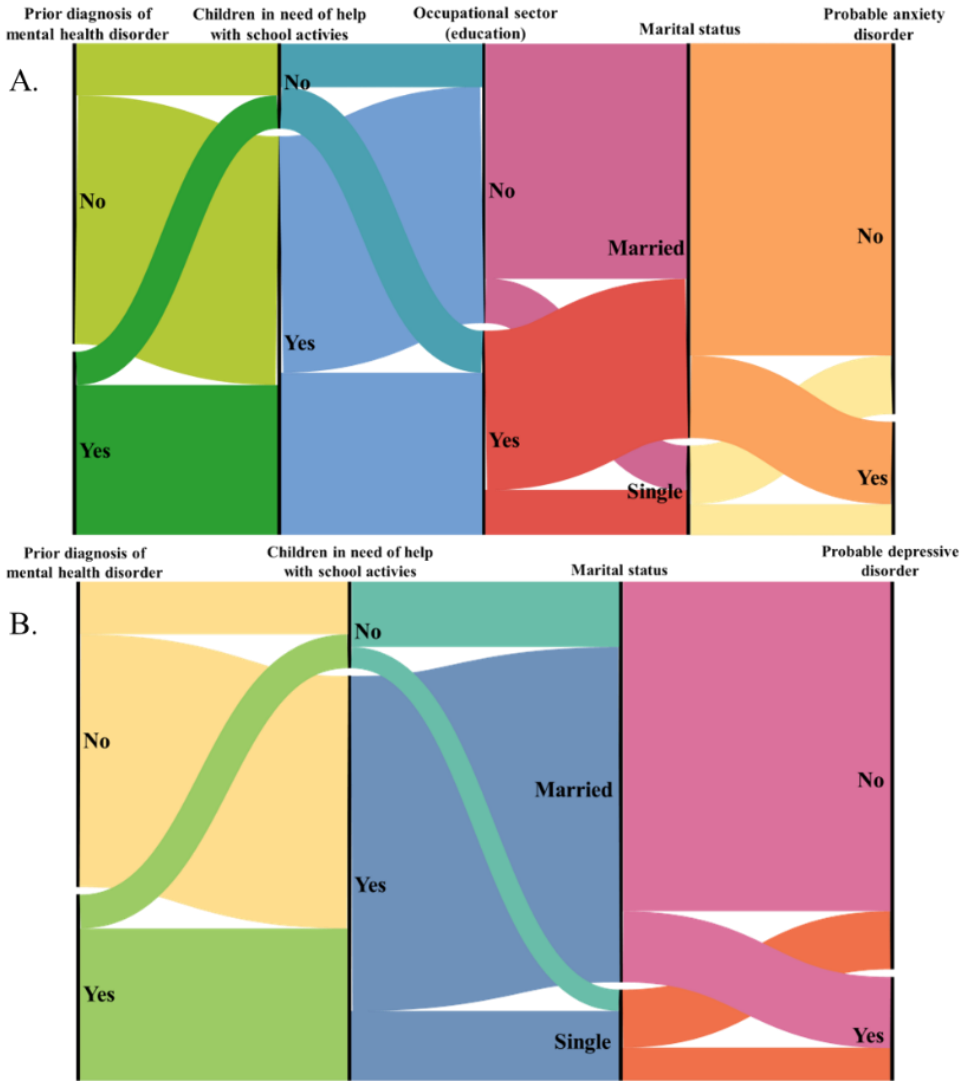

Figure 1. Sankey Diagram of the risk variables relationship to probable mental health disorder in parents. A) Anxiety disorder. B) Depressive disorder.

4 DISCUSSION

The development of serious mental health disorders during the SARS-CoV-2 outbreak is associated with changes in people's daily routine and social distancing (MANCHIA et al., 2022). Parents have been subjected to intense changes in their family routine and increased parental responsibilities brought about by emergency health policies (CLUVER et al., 2020). An important factor was the requirement to take on more active a role in formal teaching, for which they were unprepared and lacked the necessary resources to perform (LEE et al., 2021). This task, in addition to concerns about their children's learning and academic progress during ERT, intensified their stress, anxiety and depression (CALEAR et al., 2022; CUI et al., 2021; DEEB et al., 2022; LEE et al., 2021; MCGORON et al., 2022; ZHAO et al., 2020). In this

context, we addressed the impact of ERT on parents' mental health in city of Maceió (Brazil) and provides evidence on their increased presumptive anxiety and depressive disorder.

In our sample population, we observed higher prevalence rates for anxiety and depressive disorders than those found before the pandemic world-wide (anxiety: 4.05%; depression: 3.76%); in Brazil (anxiety: 8.31%; depression: 4.29%); and in the state of Alagoas (anxiety: 8.06%; depression: 4.58%) (FERRARI et al., 2022; GBD, 2020). This was expected since the Global Burden of Disease (GBD) had projected an increase in the prevalence of depression (27.6%) and anxiety (25,6%), during the first year of the pandemic (SANTOMAURO et al., 2021).

In Brazil, during the SARS-CoV-2 pandemic, the reported prevalence rates of anxiety (17.36% - 81.9%) and depressive (23.67% - 70.3%) symptoms show wide variations (CALEGARO et al., 2022; CAMPOS et al., 2020; GOULARTE et al., 2021; MORIN et al., 2021; PASSOS et al., 2020; RIBEIRO et al., 2021; SCHMITT et al., 2021; SERAFIM et al., 2021; VITORINO et al., 2021, 2022; ZHANG et al., 2021). These studies were obtained with a similar online methodology to our, as was their sample population (e.g., primarily female, with better socioeconomic level and higher degrees of education). The large variations between studies and with our own results, could be explained by the use of different measurements and cut-off points to classify the severity of symptoms. In other words, studies that included low cut-off points representing patients with mild symptoms have higher prevalence rates (PASSOS et al., 2020; ZHANG et al., 2021) than those including only severe symptoms (RIBEIRO et al., 2021). Among these studies, Zhang et al., reported a higher prevalence of moderate-to-severe symptoms of anxiety (35.9%; score ≥ 4) and depressive symptoms (53.1%; score ≥ 5) than ours (ZHANG et al., 2021). While Vitorino et al., showed closer prevalence of anxiety (29%; score ≥ 10) than ours by applying our same cut-off point, however, the prevalence of depressive symptoms (41%; score ≥ 10) was approximately twice as high (VITORINO et al., 2021, 2022). A third study by Schmitt et al., identified a comparable prevalence of depressive disorder to ours (23.67%; score ≥ 10) using the same measurements and similar cut-off point (SCHMITT et al., 2021).

In our study, parents who had children in need of help with ERT had a higher risk of developing symptoms of anxiety and depressive disorders than those who did not have this responsibility, even after controlling for potential confounders. According to several studies, parents who took responsibility for their children's learning during the period of school closures

and social confinement measures experienced higher levels of stress, anxiety, and depression (CALEAR et al., 2022; CUI et al., 2021; DEEB et al., 2022; LEE et al., 2021; MCGORON et al., 2022; ZHAO et al., 2020). However, one study found contrasting results with no significant associations between parental participation in ERT and symptoms of anxiety and depression, however a feeling of overwhelm by ERT was associated with anxiety and depression outcomes (DEEB et al., 2022). In addition, there was an association between the parents who did not feel prepared to assist in the ERT and the development of anxiety and depression disorders (LEE et al., 2021). However, studies show that parents who received school support during ERT, and consequently felt more prepared to assist their children were protected against the development of anxious and depressive symptoms (DEEB et al., 2022; MCGORON et al., 2022). Thus, school assistance appears to be an important protective factor for the development of anxiety and depressive disorders during ERE.

Another identified anxiety risk factor was belonging to the education sector, as a workers or students, which was also previously reported that teachers in homeschooling had high levels of anxiety (ZHAO et al., 2020). Lastly, our findings show that receiving financial emergency aid acted as a protective factor. This result is of high importance, since psychological disorders represent a significant burden on both the health and economic systems (CHRISTENSEN et al., 2020). Thus, by establishing emergency social policies to assist vulnerable populations and ensure their financial security, the state could be reducing the prevalence and costs associated with mental health treatments.

4.1 Study limitations and future perspectives

To perform this study, we conducted an online survey which was widely distributed, however, our sample' diversity was skewed towards middle/high-income population. This limitation may be associated to reduced internet access of illiterate and low-income individuals. In Brazil, it is estimated that 11 million people are illiterate and 7.3 million people lack internet access (IBGE, 2020, 2022), and connectivity is associated with better socioeconomic and educational level, thus, reducing the generalizability of online survey findings (LOURENCO; TASIMI, 2020).

One of the main limitation of our work is its study design. We conducted a cross-section study, which is has limited capacity to infer causality, as it does not allow to accurately ascertain the temporal relation between our main predictor and outcome. Although it is plausible to

hypothesize that ERT is a risk factor for anxiety and depression, studies with more robust designs, such as cohort studies, should be carried out to properly confirm this hypothesis.

5 CONCLUSIONS

Our results suggest that ERT negatively impact the mental health of parents. If these results are confirmed [in case it is possible to estimate the proportion of anxiety and depression potentially attributed to ERT], measures to tackle future pandemics should include strategies to support (school, social and financial) parents who are responsible for their children ERT, which would minimize the impact of the pandemic and containment measured on their mental health.

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4 CONSIDERAÇÕES FINAIS

As crescentes responsabilidades das figuras parentais na educação formal dos filhos durante o ensino remoto emergencial, implementadas pelas políticas emergenciais de saúde durante a pandemia da COVID-19 são um fator de risco para o desenvolvimento de transtornos de ansiedade e depressão. Além disso, os desafios aumentam quando as figuras parentais pertencem ao setor educacional, são solteiras e possuem um transtorno mental pré-existente. Além disso, demonstramos que o auxílio emergencial tem efeito protetor contra o desenvolvimento de sintomas depressivos.

Até onde sabemos, este é o primeiro estudo brasileiro a avaliar o efeito da responsabilidade e do apoio prestado pelas figuras parentais durante o ERE na saúde mental, bem como o valor protetor das políticas educacionais e sociais emergenciais brasileiras. No entanto, pesquisas futuras, incluindo mais informações sobre as características da participação das figuras parentais no ERE, assim como estudos de acompanhamento e amostra nacionalmente representativa devem ser realizadas para entender melhor os efeitos de curto e longo prazos dos desafios trazidos pelo SARS-CoV-2 e isolamento social.

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APÊNDICE A – Questionário sociodemográfico e efeitos da COVID-19

- Idade:
- Sexo: ( ) feminino ( ) masculino
- Estado civil: ( ) casado(a)
  ( ) solteiro(a)
  ( ) separado(a)
  ( ) viúvo(a)
- Grau de escolaridade:
  ( ) ensino fundamental incompleto
  ( ) ensino fundamental completo
  ( ) ensino médio incompleto
  ( ) ensino médio completo
  ( ) ensino técnico incompleto
  ( ) ensino técnico completo
  ( ) ensino superior incompleto
  ( ) ensino superior completo
- Ocupação:
  ( ) trabalhador da área da saúde
  ( ) professor(a) ou aluno(a)
  ( ) outros
- Renda familiar mensal:
  ( ) até um salário mínimo
  ( ) até dois salários mínimos
  ( ) até três salários mínimos
  ( ) maior que três salários mínimos
- Possui filhos ou é responsável por um indivíduo em idade escolar?
  ( ) não
  ( ) sim, 1 filho
  ( ) sim, 2 filhos
  ( ) sim, 3 ou mais
- Caso a resposta anterior seja positiva, qual o grau de escolaridade que seu filho ou aluno pelo qual é responsável se encontra? (caso seja pai ou responsável por mais de um aluno e eles apresentarem graus de escolaridade diferentes, pode marcar mais de uma alternativa)
  ( ) educação infantil
  ( ) ensino fundamental 1
  ( ) ensino fundamental 2
  ( ) ensino médio
  ( ) ensino técnico
  ( ) ensino superior
- Em algum momento de sua vida você já foi diagnosticado com algum tipo de transtorno relacionado à saúde mental?
  ( ) não
  ( ) sim, ansiedade
  ( ) sim, depressão
  ( ) sim, transtorno de estresse pós-traumático
  ( ) outro

Sobre o período de pandemia da COVID-19:

- Como sua ocupação foi afetada pelo surto de COVID-19?
  ( ) continuo minhas atividades com as medidas de proteção (linha de frente ou serviços essenciais)
  ( ) continuo as atividades por home office
  ( ) meu salário foi reduzido
  ( ) perdi meu emprego
  ( ) estou sem atividades
- Você foi contemplado com o auxílio emergencial do Governo Federal?
  ( ) não ( ) sim
- Caso possua filho(s) ou seja responsável por algum aluno, ele(s) necessita(m) de sua ajuda para realização das atividades escolares durante o surto de COVID-19?
  ( ) não
  ( ) sim, necessita (m)
  ( ) sim, mas não todos

Conhecimentos acerca da COVID-19

- Quantas horas diárias você gasta com foco nas informações sobre o surto da COVID-19? (jornais, internet, WhatsApp).
  ( ) menos de 1 horas
  ( ) entre 1 e 2 horas
  ( ) mais de 2 horas
- Assinale as alternativas que julgar correta:
  ( ) a inalação de gotículas de espirros, tosse ou conversas com uma pessoa infectada pode causar infecção;
  ( ) o contato com algo contaminado por uma pessoa infectada pode levar à infecção;
  ( ) o contato com uma pessoa assintomática também pode levar à infecção;

( ) já existem medicamentos direcionados que podem curar a doença;
( ) tomar hidroxicloroquina ou cloroquina pode prevenir a infecção desta doença;
( ) tomar ivermectina pode prevenir a infecção desta doença;
( ) O uso de álcool a 70% ou água sanitária ajuda na desinfecção de objetos e superfícies.
( ) Se uma pessoa da casa tiver diagnóstico positivo, todos os moradores ficam em isolamento por 14 dias também

ANEXO A – Generalized Anxiety Disorder-7 (GAD-7) scale

GAD-7

Durante as <u>últimas 2 semanas</u>, com que freqüência você foi incomodado/a pelos problemas abaixo? *(Marque sua resposta com "✔")*	Nenhuma vez	Vários dias	Mais da metade dos dias	Quase todos os dias
1. Sentir-se nervoso/a, ansioso/a ou muito tenso/a	0	1	2	3
2. Não ser capaz de impedir ou de controlar as preocupações	0	1	2	3
3. Preocupar-se muito com diversas coisas	0	1	2	3
4. Dificuldade para relaxar	0	1	2	3
5. Ficar tão agitado/a que se torna difícil permanecer sentado/a	0	1	2	3
6. Ficar facilmente aborrecido/a ou irritado/a	0	1	2	3
7. Sentir medo como se algo horrível fosse acontecer	0	1	2	3

(*For office coding: Total Score T*____ = ____ + ____ + ____)

ANEXO B – Patient Health Questionnaire-9 (PHQ-9) scale

QUESTIONÁRIO SOBRE A SAÚDE DO/A PACIENTE- (PHQ-9)

Durante as últimas 2 semanas, com que freqüência você foi incomodado/a por qualquer um dos problemas abaixo? *(Marque sua resposta com "✓")*	**Nenhuma vez**	**Vários dias**	**Mais da metade dos dias**	**Quase todos os dias**
1. Pouco interesse ou pouco prazer em fazer as coisas	0	1	2	3
2. Se sentir "para baixo", deprimido/a ou sem perspectiva	0	1	2	3
3. Dificuldade para pegar no sono ou permanecer dormindo, ou dormir mais do que de costume	0	1	2	3
4. Se sentir cansado/a ou com pouca energia	0	1	2	3
5. Falta de apetite ou comendo demais	0	1	2	3
6. Se sentir mal consigo mesmo/a — ou achar que você é um fracasso ou que decepcionou sua família ou você mesmo/a	0	1	2	3
7. Dificuldade para se concentrar nas coisas, como ler o jornal ou ver televisão	0	1	2	3
8. Lentidão para se movimentar ou falar, a ponto das outras pessoas perceberem? Ou o oposto – estar tão agitado/a ou irrequieto/a que você fica andando de um lado para o outro muito mais do que de costume	0	1	2	3
9. Pensar em se ferir de alguma maneira ou que seria melhor estar morto/a	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

Se você assinalou qualquer um dos problemas, indique o grau de dificuldade que os mesmos lhe causaram para realizar seu trabalho, tomar conta das coisas em casa ou para se relacionar com as pessoas?

Nenhuma dificuldade	**Alguma dificuldade**	**Muita dificuldade**	**Extrema dificuldade**
☐	☐	☐	☐

Desenvolvido pelos Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke e colegas, com um subsídio educacional da Pfizer Inc. Não é necessária permissão para reproduzir, traduzir, exibir ou distribuir.

ANEXO C – Parecer consubstanciado do CEP

UNIVERSIDADE FEDERAL DE ALAGOAS

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Avaliar o impacto das modificações na rotina diária e do ambiente familiar provocadas pela pandemia da COVID-19 na saúde mental dos pais de alunos infanto-juvenis

Pesquisador: Marcelo Duzzioni
Área Temática:
Versão: 2
CAAE: 33845320.7.0000.5013
Instituição Proponente: Instituto de Ciências Biológicas e da Saúde
Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 4.211.376

Apresentação do Projeto:
Diferentes impactos ocasionados pela COVID-19 estão sendo sentidos diariamente em várias áreas da sociedade, ocasionando de forma silenciosa prováveis danos à saúde mental das pessoas. Em virtude das medidas de enfrentamento da COVID-19, os pais dos alunos infanto-juvenis tiveram que se adaptar ao fechamento das escolas e as consequências disso na rotina diária das famílias, e.g., nas atividades de aprendizagem remota dos filhos. Novas ferramentas de ensino-aprendizagem voltadas para educação online têm feito parte do cotidiano não só dos estudantes, mas também dos seus pais/cuidadores. Entretanto, muitos pais não se sentem preparados para lidar com essas novas estratégias de ensino. Além disso, somadas as preocupações diárias com as atividades laborais, incluindo as domésticas, e as com a pandemia da COVID-19, muitos pais podem manifestar sintomas relacionados com transtornos de ansiedade e depressão. Diante disso, o presente projeto tem por objetivo avaliar o impacto das modificações na rotina diária e do ambiente familiar provocadas pela pandemia da COVID-19 na saúde mental dos pai de alunos infanto-juvenis, através de um estudo observacional transversal. Para isso, será utilizada uma amostra aproximada de 800 pais/responsáveis por crianças, pré-adolescentes ou adolescentes matriculados na rede de ensino pré-escolar e fundamental do município de Maceió, estado de Alagoas (Brasil). Estes pais serão submetidos a um questionário via online, dividido em três sessões, a fim de coletar dados epidemiológicos/demográficos e conhecimentos acerca da COVID-

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Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_1574383.pdf	06/08/2020 09:49:34		Aceito
Cronograma	3_CRONOGRAMA_novo_2.pdf	06/08/2020 09:48:34	Marcelo Duzzioni	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	4_TCLE_novo_2.pdf	06/08/2020 09:48:20	Marcelo Duzzioni	Aceito
Outros	CARTA_RESPOSTA_2.pdf	06/08/2020 09:47:51	Marcelo Duzzioni	Aceito
Projeto Detalhado / Brochura Investigador	PROJETO_COVID19_ISOLAMENTO_novo_2.pdf	06/08/2020 09:47:20	Marcelo Duzzioni	Aceito
Declaração de concordância	10_TERMOS_DE_ANUENCIA_DOS_ALUNOS.pdf	18/06/2020 18:51:43	Marcelo Duzzioni	Aceito
Declaração de Pesquisadores	9_EXPLICITACAO_DAS_RESPONSABILIDADES_DO_PESQUISADOR.pdf	18/06/2020 18:51:29	Marcelo Duzzioni	Aceito
Outros	8_DECLARACAO_DE_INEXISTENCIA_DE_ACORDOS_PREEXISTENTES_QUANTO_A_PROPRIEDADE_DAS_INFORMACOES_GERADAS.pdf	18/06/2020 18:49:30	Marcelo Duzzioni	Aceito
Outros	7_EXPLICITACAO_DOS_CRITERIOS_PARA_SUSPENDER_OU_ENCERRAR_A_PESQUISA.pdf	18/06/2020 18:47:35	Marcelo Duzzioni	Aceito
Outros	5_CUMPRIMENTO_DAS_NORMAS_DA_RESOLUCAO_DE_PUBLICIZACAO_DOS_RESULTADOS.pdf	18/06/2020 18:46:18	Marcelo Duzzioni	Aceito
Outros	2_CURRICULO_LATTES_DOS_PARTICIPANTES.pdf	18/06/2020 18:35:30	Marcelo Duzzioni	Aceito
Declaração de Instituição e Infraestrutura	6_DEMONSTRATIVO_DE_EXISTENCIA_DE_INFRAESTRUTURA_DA_PESQUISA_E_PARA_ATENDER_EVENTUAIS_PROBLEMAS.pdf	18/06/2020 18:31:09	Marcelo Duzzioni	Aceito
Cronograma	3_CRONOGRAMA.pdf	18/06/2020 18:27:45	Marcelo Duzzioni	Aceito
Folha de Rosto	1_FOLHA_DE_ROSTO.pdf	18/06/2020 18:14:39	Marcelo Duzzioni	Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

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