



Brazilian adolescents' emotional responses to information about the Covid-19 pandemic posted on digital media

Respostas emocionais de adolescentes brasileiros às informações sobre a pandemia da Covid-19 postadas nas mídias digitais

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ABSTRACT

This study investigated the emotional responses (ER) of 9 Brazilian adolescents between the ages of 15 and 17 to news publications about Covid-19 shared on digital media. It is qualitative study that included semistructured online interviews with the participants. The interviews were supported by news publications about the Covid-19 pandemic. The theoretical frameworks of authors such as Paul Ekman, António Damásio, and Albert Bellochi were adopted as a basis for identifying emotions and discussion of the data. Our results reveal a clear emotional impact of pandemic-related news on the participants, with ER of sadness, surprise, disdain, and relief occurring most frequently. Other emotions such as anger, contentment, fear, and disgust were observed occasionally. These emotions emerged from considering elements such as the attitudes of people disregarding Covid-19 safety guidelines and the rapidity with which information about the disease spread on digital media. As recommendations, we highlight the influence that digital media exercises over adolescents' ER, a fact which draws attention to the degree of responsibility involved in publishing verified journalism, in a humane way and without engaging in alarmism, especially with regard to themes related to healthcare in a (post)-pandemic period.

Keywords: Covid-19; Digital Media; Emotions; Adolescents.

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RESUMO

Esta pesquisa investigou as respostas emocionais (RE) de 9 adolescentes brasileiros com idades entre 15 e 17 anos diante de notícias divulgadas pelas mídias digitais sobre a Covid-19. Tais notícias se centraram em temas como vacinas, medicamentos para tratamento da Covid-19, entre outros relacionados. Trata-se de um estudo qualitativo, com a realização de entrevistas semiestruturadas com os participantes, no formato online. As entrevistas foram amparadas por notícias sobre a pandemia da Covid-19. Para a identificação das emoções e discussão dos dados, adotamos construções teóricas de autores que discutem a temática das emoções, como Paul Ekman, António Damásio e Alberto Bellocchi. Dentre os resultados, ficou evidente o impacto emocional causado pelas notícias sobre a pandemia nos adolescentes, com RE de tristeza, surpresa, desprezo e alívio, em maior frequência. Outras como raiva, contentamento, medo e aversão foram identificadas de modo pontual. Tais emoções emergem de considerações, como atitudes das pessoas em descumprir medidas de proteção contra a Covid-19, e a rápida velocidade da disseminação da doença nas mídias digitais. Como encaminhamentos, destacamos a influência que as mídias digitais têm nas RE dos adolescentes, fato que alerta para a responsabilidade em publicizar notícias verdadeiras, de forma humana e não alarmista, em especial em temáticas sobre saúde em um período (pós)pandêmico.

Palavras-chave: Covid-19; Mídias Digitais; Emoções; Adolescentes.

1. INTRODUÇÃO

The Covid-19 pandemic can be characterized as a phenomenon that changed contemporary society due to its rapid spread and far-reaching consequences, leading to shifts still felt today (Guzzo; Souza; Ferreira, 2022). A number of daily activities had to be altered due to changes such as school closures (Sobrinho Junior; Moraes, 2020), "stay home" guidelines, and remote learning (Silva; Neto; Santos, 2020), and these changes were experienced in markedly individual ways by those affected. In Brazil, as in most countries, the educational system and a number of areas of the workforce had to be adapted to virtual environments (Bartoski *et al.*, 2023). In-person social activities were avoided by necessity and spaces designed for such activities remained inactive for most of the period (Marques; Fraguas, 2020). The healthcare system was one of the most impacted areas, collapsing at certain points in time and in certain areas of the country due to the high numbers of hospital admissions and insufficient capacity for the number of patients requiring care. In the political sphere, defenses of unproven treatments for the virus were commonplace, fomenting fake news on digital media and negationist movements against science (Caponi *et al.* 2021).

The Covid-19 pandemic is considered one of the largest public health emergencies faced by the international community in recent decades (Schmidt *et al.*, 2020) and was permeated by diverse emotions that brought concerns to bear in areas beyond physical health – already at eminent risk due to the virus – that affected the mental health of the population. Examples of these emotions include fear of contracting the disease and/or of family members contracting and succumbing to the virus; sadness caused by the loss of in-person social contact; stress related to adapting to virtual environments, compromising attention and performance on tasks executed in this context; and worries regarding the credibility of the results of scientific research related to the prevention and treatment of the disease as the virus proliferated, among other aspects. As such, it is common knowledge that the Covid-19 pandemic continues to affect, both directly and indirectly, not only the



lives of every member of the population, but also, in particular, the adolescent demographic, due to the intense social dynamics, personal discoveries, and milieu inherent to this developmental stage.

Adolescence is a period of life characterized by numerous discoveries, be they related to ones own body and sexuality, the exploration of new social relationships, as well as by the search for acceptance among peers and the contradiction between independence from and dependence on the family members responsible for the adolescent. Due to adolescence's nature as a phase between the departure from childhood and the arrival at adulthood, consisting of major changes and social pressures (ideals related to the body, professional decisions, group belonging, etc.), it is well-known that emotions are experienced intensely at this stage of development (Erikson, 1994; Knobel, 1981).

A number of studies carried out in the Brazilian context have demonstrated the presence of depressive and anxious conditions in children and adolescents during the Covid-19 pandemic. Peixoto et al. (2022), in a literature review on childhood and adolescent mental health in the context of the pandemic, highlight that these studies have revealed that "the pandemic was a potentially critical factor for the development of mental health disorders and the aggravation of loneliness in children and adolescents" (Peixoto et al., 2022, p. 9). Borges, Nakamura, and Andaki (2022) corroborated this finding in their investigation of anxiety symptoms, depressive symptomatology, and sociodemographic and behavioral factors manifested by 157 adolescents during the pandemic. Among their results, they emphasized that 65.6% of participants presented with symptoms of anxiety and 55.8% presented with depressive symptomatology. The authors also note that this "high prevalence of symptoms of anxiety and the symptomatology observed in this study corroborate data from other countries" (Borges; Nakamura; Andaki, 2022, p.5).

Expanding on this point, Navarro-Soria *et al.* (2023), in their analysis of the vulnerabilities of children and adolescents in different cities in Spain, cite and compare several studies that analyzed parental perceptions of children's emotional and behavioral problems during the pandemic in several countries. These observations included alterations to sleep patterns and appetite, as well as a 20% increase in anxiety levels in countries such as China, Germany, and Bangladesh (in India, this increase reached 70%). Moreover, after completing a longitudinal study in Spanish cities that analyzed parental perceptions of children's anxiety levels, sleep disorders, and executive functioning (including emotional regulation) during an 18 months period of the Covid-19 pandemic, the authors concluded that these phenomena were positively correlated with the levels of confinement experienced. These results serve to outline how the pandemic scenario was capable of impacting the health of these demographics.

This dynamic was well demonstrated by an online survey of 7.7 thousand Brazilians between the ages of 15 and 19 performed by UNICEF (2022) in May, 2022. This period was just subsequent to the most intense phase of the pandemic in Brazil, as routines were beginning to return to normalcy. Results showed that half of the respondents felt the need to seek out help for their mental state. Among the respondents, 35% reported anxious feelings, 14% reported happiness, 11% worried about themselves, 9% were indifferent, and 8% were depressed. It is also worth noting that the adaptations to virtual environments that the pandemic required highlighted adolescents' exceptional familiarity with digital media. Immersed in an increasingly technological world since birth, their



adaptability was evident both in their interactions with peers and their ability to manage school work, allowing them to handle these changes with apparent ease.

Digital media can be described as platforms for accessing and sharing information that require electronic devices (laptops, tablets, and cell phones) connected to the internet. This includes numerous types of websites, such as blogs, corporate and educational/research institution web pages, online news outlets, video sharing platforms such as YouTube, applications, podcasts, and social networks (WhatsApp, Instagram, Facebook, Twitter, TikTok). The content shown on these platforms is typically different for each user, and is often selected by artificial intelligence-controlled algorithms that provide content similar to whatever the user accesses most frequently, which the algorithm interprets as interest in that topic on the part of the user. Of particular interest are the so-called public relevance algorithms, which “function to predict behavior and preferences based on a database and predefined criteria [...] [being] the primary type of algorithm used on social media platforms and search engines” (Jurno and Dalben, 2018). This dynamic has recently been the subject of significant debate (Kaufman and Santanella, 2020). Aside from these algorithms, ChatGPT creates full texts on requested themes (including scientific ones) in a matter of seconds and has been challenged as controversies and debates around artificial intelligence tools have expanded (Lund and Wang, 2023).

Digital media facilitates the dissemination of knowledge, particularly scientific knowledge, and as such can be beneficial in a number of ways. For example, it can facilitate the dissemination of information of interest to specific demographics, as was the case for the Covid-19 pandemic and its developments. During the pandemic period, specifically, digital media contributed to the population’s ability to keep up with new discoveries about the virus, learn about preventative measures and treatments, and access other relevant information (Liu, 2020). For adolescents, digital media facilitated education, expanded their knowledge of the world and of themselves, and provided new and important information about adolescence itself. In other words, social media became “a great ally to education during and after the pandemic period, facilitating communication and allowing classes and social activities to avoid total paralysis” (Moura, 2024, p. 362).

In counterpoint, digital media also placed adolescents in a position of vulnerability by permitting large-scale dissemination of highly variable, potentially harmful content, at times without filters or restrictions. In extreme cases, there were games such as “Blue Whale”, a suicide game that was released in Russia in 2013 (Mukhra *et al.*, 2019) that consisted of tasks to be completed by young players that involved sending photographic proof of self-mutilation, eventually culminating in suicide (Bedinelli and Martin, 2017). More recently, threats of violence in Brazilian schools have been published on social networks without credible sources, alarming youths across the country (Nunes, 2023). Regarding this mixture of the positive and negative effects and potentialities of digital media, Castillo; Castillo-López; Dias; García-Castillo (2020) affirm, in their discussion of young people’s social network use patterns, that:

The massive use of social networks and instant messaging by young people results in two possibilities. On the one hand, social networks increase the quantity of opportunities for interacting with individuals from across the globe, the ability to access social support, or to help to create one’s own identity; on the other hand,



social networks increase the number of potential dangers, such as those resulting from cyberbullying or real encounters with strangers, among many others (Castillo; Castillo-López; Dias; García-Castillo, 2020, p.3).

With regard to this dual interpretation, adolescents may not yet consciously perceive the influence that information present on digital media can exercise over them. Koffermann and Aguaded (2023) demonstrate that adolescents are frequently exposed to content posted on digital media and that its accessibility is a growing phenomenon. They argue that virtual information can contribute to opinion formation in young people in a more subjective way, through language that is often informal and comedic, than other forms of communicating with youth, such as more objective measures implemented by teachers and family members.

Such considerations allow for reflections on the emotional dynamics that permeate social media content, as well as how adolescents interpret them. Given this context, this study aimed to investigate the emotions felt by adolescents when publications on the topic of Covid-19 on digital media were presented to them in order to understand the emotional impacts of the pandemic on this specific demographic. Castillo; Castillo-López; Dias; García-Castillo (2020) emphasized the importance of developing strategies capable of assisting institutions, professionals, and families to manage the impacts of Covid-19 on adolescents. This article is a part of a master's thesis composed from 2021 to 2023 as part the Postgraduate Program in Education at the Federal University of Triângulo Mineiro, Brazil (Vianna, 2023).

2. THEORETICAL FRAMEWORK

Emotions can be understood as state of an individual's body changing as a result from cerebral processing of information received from that individual's environment (Damásio, 2012). For centuries, authors such as the naturalist Darwin (2009) have studied the phenomena of emotions, and have identified that they possess innate and universal aspects. Though names related to different sentiments may vary between cultures, they are understood as mental states in which emotions are experienced (Vygotsky, 2004). Other authors have contributed to the discipline over the years as well, such as James (1884), the philosopher and psychologist, who related body movements to the perception of emotions and sentiments, and LeDoux (2011), a neuroscientist who deepened modern understanding of the structures and circuits of the human brain that are involved in the perception of environmental stimuli and their respective emotional responses.

The psychologist Paul Ekman (2011), for example, defined a set of basic and universal emotions, which may emerge concurrently or in an alternating fashion, consisting of happiness, sadness, anger, fear, surprise, disgust, and disdain, and which are applied to ranges of similar emotions. Ekman defines happiness as an agreeable state with nine nuances of intensity. Three of these are joy (the most intense of all, commonly accompanied by a smile), relief (due to the mitigation of a previous intense emotion, which may be accompanied by a sigh) and contentment (a low intensity nuance accompanied by a relaxed face). Though these nuances of happiness can be differentiated by the presence and timing of facial expressions, the primary signal system for happiness is vocal, rather than facial (Ekman, 2011, p. 75), as the voice generally allows for the identification of emotions



without viewing a facial expression, though both are important to the identification of emotional responses.

Sadness, also described as melancholy or disappointment, is defined by Ekman as an emotion evoked by loss:

[...] the rejection of a friend or lover; the loss of self-esteem through failure to achieve an objective at work; the loss of a superior's admiration or praise; the loss of health; the loss of some part of the body or bodily function due to an accident or disease; and, for some, the loss of a treasured object (Ekman, 2011, p.99).

Ekman (2011) goes on to state that sadness can present concurrently with factors such as a lowered voice and a withdrawn posture. Indicators that should be considered when identifying sadness include tears, an open mouth with lowered corners, raised cheeks, a lowered gaze, a loss of muscle tone, a retracted posture, and a lower and softer voice. Ekman defines anger as an emotion that occurs in situations of injustice and disappointment, and as being represented by an expression that signals attack or violence. In this context, several parameters are frequently present and should be considered as signals of anger when identifying this emotion in responses, such as: lowered and gathered eyebrows, a fixed gaze, a tightened jaw, and a closed mouth with pursed lips or exposed teeth, as well as a loud voice.

Ekman (2011) defines fear as a response to physical or psychological threats, and as associated with a leaning back of the thorax, as if to avoid the threat. This emotion is divided into being based on fright, terror, shyness, or shame. It is noteworthy that, on feeling shame, a person may present physiognomic alterations such as a retracted chin, raised upper eyelids and tense lower eyelids, and a head and/or body position directed away from the target of the response. These are important observations that must be attended to when identifying emotional responses, especially fear. Surprise, for Ekman, occurs in reaction to an unexpected event, and can be characterized by widened eyes and raised eyebrows. The author mentions that this emotion is "more brief" in nature, that is, it may last only a few seconds and be motivated by a sudden event. Ekman (2011) also describes the emotions of disgust and contempt, both caused by disagreeable stimuli, as varying among individuals and ideologies. Contempt is characterized by a position reminiscent of authority, with the chin raised and eyes cast down, or as varying between physical stimuli and rejected opinions. Disgust, in turn, is shown through the apparent enlarging of the lips and nostrils.

In addition, neuroscientist António Damásio (2012) presents the "somatic marker hypothesis", in which agreeable or disagreeable bodily (somatic) sensations are associated with an individual's experiences. For this reason, these sensations evoke mental images (markers) that, in turn, suggest possible outcomes of new scenarios that are similar to the scenario that generated the marker. This hypothesis is related to emotions due to the fact that new situations recall previously experienced emotions and/or their associated memories, which may affect decision making processes. If these stimuli are disagreeable, it is probable that the person will attempt to avoid repetition and either escape the situation or attempt to act in a different way. If they are agreeable, it is probable that the person will repeat their previous actions. Damásio (2012) highlights that "somatic marker



hypothesis" depend as much on functional neural networks and internal processes as they do external situations, and that they also are influenced by convention and social expectations:

Survival coincides with the reduction of disagreeable body states and the achieving of homeostasis, i.e., functionally balanced biological states. The internal system of preferences finds itself inherently predisposed to avoid pain and seek pleasure, and it is most likely pre-tuned to reach these objectives in social situations (Damásio, 2012, p.75).

Damásio (2012) also classifies emotions as either primary or secondary. Primary emotions are defined by him as automatic, observed in early childhood, and associated with basic cerebral processes. Secondary emotions, for Damásio (2012), are defined as acquired and developed throughout life: conscious experiences that are learned through social interactions and that require the participation of more complex brain structures. Damásio's (2012) primary and universal emotions includes happiness (varying in euphoria and ecstasy), sadness (varying in melancholy and anxiety), anger, fear (varying in panic and timidity), and disgust. Examples of secondary emotions cited by this author are shame, remorse, and vengeance. However, James (1884) and Damásio (2012) argue that emotions experienced in childhood are innate and generated by a pre-organized mechanism, and that emotions of adults have "scaffolds that were gradually constructed over the foundations of those 'initial' emotions" (Damásio, 2012, p. 129).

A separate perspective on emotions has been presented by Alberto Bellocchi (2015) as part of his work in education. This perspective proposes that emotions involve body, speech, and mind, intrinsically linking human behavior and emotion. As such, the key aspects to observe when identifying emotions are facial expression, in which the facial features can indicate emotions; gestures, such as head, hand, and full body movements; vocalizations, in which the oscillations of the voice can be indicative of certain emotions; self-reports, in which a person speaking of their own emotional experiences is seen as important in identification of emotions; and observational journaling, carried out via reports of research subjects' experiences (Bellocchi, 2015, p. 3-5).

For this reason, Bellocchi describes a set of necessary aspects for the identification of emotions in scientific studies that includes facial expressions, gestures, vocalizations, and subject self-reports of relevant events and emotional experiences. It is worth noting that these observations must be made by researchers due to their potential to last only a few seconds. They should also not be analyzed in isolation, as larger data sets allow for greater precision in the identifying prevailing emotions.

In light of this present study's objectives, an approach was chosen that combines Ekman's (2011) definition of basic and universal emotions, Damásio's (2012) somatic marker hypothesis, and Bellocchi's (2015) identification framework. These three theoretical contributions constitute a strong foundation for the investigation of the emotional responses of adolescents to digital media publications on the topic of Covid-19.



3. PROCEDURES AND METHODS

This study's objective was to identify and analyze the emotional responses of Brazilian adolescents to digital media publications on the topic of Covid-19 in order to better understand the emotional impacts of the pandemic on this demographic. It was considered and approved by the Ethics in Research Committee under Ethical Consideration and Approval Certificate number CAAE 48296921.1.0000.5154, ethics committee of Federal University of Triângulo Mineiro, Brazil.

The study methodology proceeded as follows: first of all, a participation public call for was put out on digital media (Instagram, Facebook, and WhatsApp) by this study's research team and the larger (Vianna, 2023) research group. This public call included a Google Forms link in which interested individuals filled out their personal data, including the names and WhatsApp numbers of both the subjects themselves and their guardians.

The form was completed by 22 adolescents or guardians. At this point, a WhatsApp message was sent containing the Free and Informed Consent Form for guardian authorization, as well as the researchers' contact information in order to answer any questions or make any necessary clarifications. All 22 guardians were contacted in this way and 20 confirmed their interest in participating and filled out the Free and Informed Consent Form. Subsequently, the adolescents were contacted in order to schedule the interviews that comprise this study's empirical data set. Of the 20 scheduled interviews, 7 did not occur due to the adolescents not appearing at the scheduled time and they did not demonstrate interest in continuous participating in the study at a later date.

The 13 interviews that were performed occurred online, on the Google Meet platform. They began with rapport building in order to establish empathy and reduce potential resistance (Cohen, Swerdlik and Sturman, 2014), which was followed by the application of the research instruments discussed below. All interviews were recorded (audio and video) and transcribed.

At the beginning of each interview, the Free and Informed Assent Form was sent to, read, and signed by the subjects. Both the Free and Informed Consent Form and the Free and Informed Assent Form guaranteed the subjects' privacy and anonymity, discussed their voluntary, individual, and completely online participation through open-access platforms, and made clear their right to withdraw their participation at any time, as well as the psychological assistance that was available to them in the event that the protocol could cause any form of emotional trigger.

3.1. Instruments

The instruments applied for the data set construction were appropriate to the subjects' age range and the study's objectives. The research team created a semi structured interview script with questions on the topics of digital media, information shared on digital media and Covid-19. Two news article headlines, with sources listed, were presented to the subjects as well, accompanied by a brief and objective oral explanation of the content and the text by the researcher-interviewer.

The script contained an initial section of general topics: what publications the participants remembered having seen on digital media in recent weeks; whether they attempted to verify the information they encountered and, if so, how that attempt was made; if they could recall any



publications on digital media that caused an impact on them in the past year, and what thoughts and emotions they experienced due to those publications. After this, the selected news articles were shown to the participants, one at a time, in order to understand what the participant thought about the news and what were his emotions in the face of the news.

The first article carried the headline "Deaths from Covid among the unvaccinated are 26 times higher than among the immunized, indicates report" (G1 SP, 2022). It discussed a report made by the São Paulo State Secretary of Health, which cross-referenced over 7 thousand deaths with Covid vaccination records. The second article was titled "Two years ago, the first Covid-19 victim died in Brazil" (Collucci, 2022). It traced a panoramic narrative of the oscillating numbers of Covid deaths in the country over the pandemic time, from initial outbreak to eventual decline, which allowed for a relaxation of the then-mandatory use of masks, as well as the reopening of public places in a gradual return to social contact. Both articles were published by nationally recognized newspapers with large digital media followings (their own sites and social networks) and high numbers of shares due to their status as influential sources in the country. They also were about emergent themes at the time of the interviews, and each presented positive and negative aspects.

The Beck Depression Inventory II (Gorenstein *et al.*, 2011) and Beck Anxiety Inventory (Cunha, 2001), which aim to identify the intensity of depressive and anxious states, respectively, were applied to all participants. It is important to declare that these instruments management is restricted to licensed psychologists (Cunha, 2011; Gorenstein *et al.*, 2011) and that they were applied by the study's author who has a psychology degree and active professional license. The inventories were utilized as exclusion criteria in order to eliminate the influence of anxious and depressive symptoms on this study's results. Both symptoms, when intense, can be related to mental disorders, affecting the individual's ability to concentrate, think, and act, as well as significantly altering their perception and interfering with interest in daily activities and interpersonal relations (American Psychiatric Association, 2014). As such, it is noteworthy that, if a research's participants had been identified as meeting these conditions, the instruments could have indicated this in order to avoid the aggravation of their mental states through exposure to the research themes.

3.2. Participants

Of the 13 interviewed adolescents, 9 were selected for use in the data set after exclusions based on Beck Depression Inventory II (Gorenstein *et al.*, 2011) and Beck Scale Anxiety Inventory scores (Cunha, 2001). These 9 participants were between 15 and 17 years old and were between the 8th year of elementary school and the 3rd year of high school (the Brazilian school system is composed of 9 elementary years and 3 high school years).

Socioeconomic status was evaluated from the Brazilian Economic Classification Criteria (*Critério de Classificação Econômica Brasil*) published in 2019 by the Association of Brazilian Research Corporations (*Associação Brasileira de Empresas de Pesquisa*) in order to better understand the participant's socioeconomic backgrounds. 6 of them were classified as B2, 2 as B1, and 1 as A. These represent, in general terms, middle- and upper-class designations in the Brazilian context.

The participants were geographically distributed as follows: 7 resided in a city of 337,092 people in a countryside city of Minas Gerais State. The other 2 lived in a city of 30,614 people in the São Paulo



countryside. In order to preserve their anonymity, they were given the following code names: Camila, Fabiana, Flávia, Gael, Giovana, Gustavo, Júlio, Paulo, and Thomás.

3.3. Data analysis

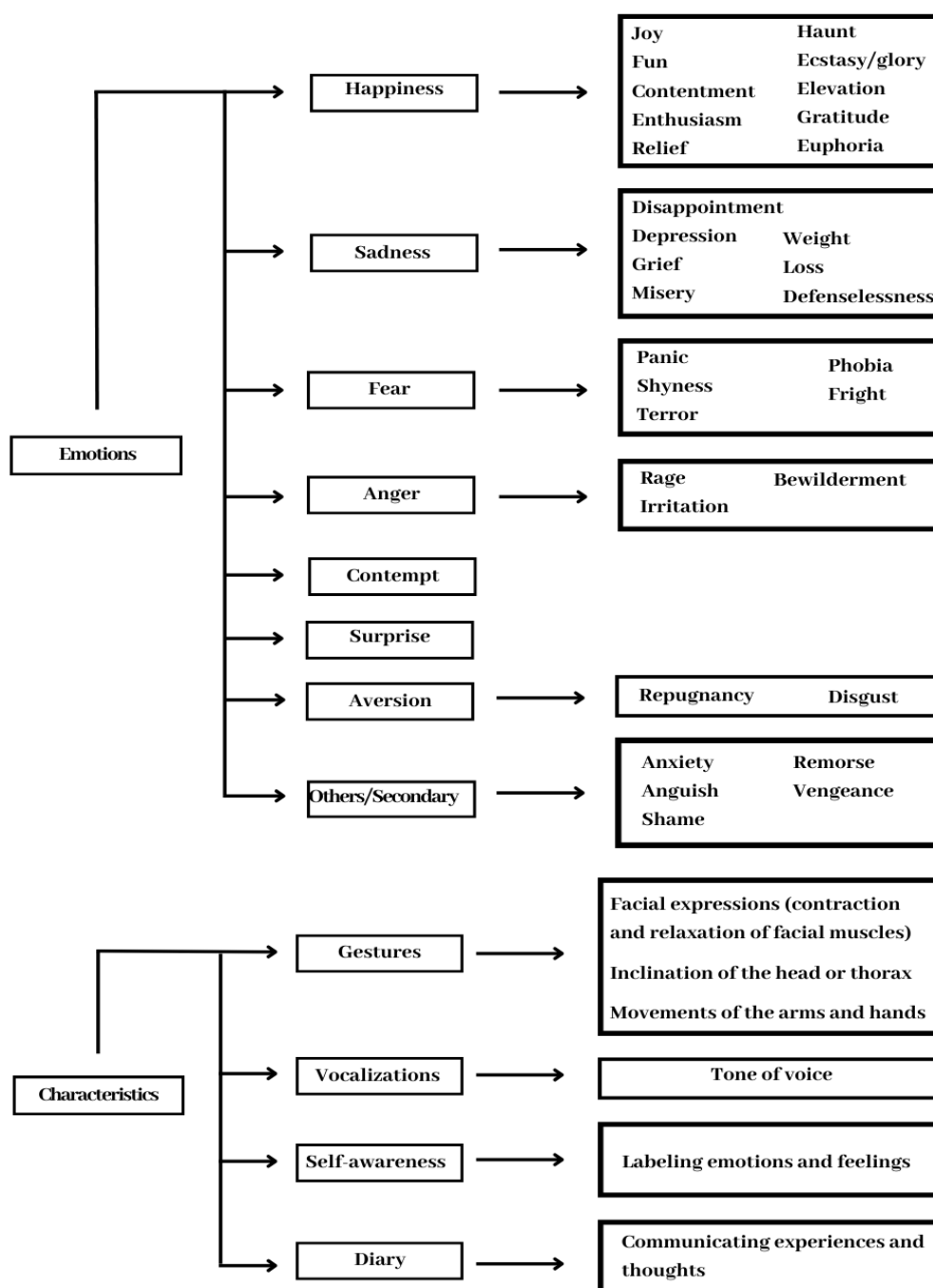
The data analysis in this study was qualitative in nature due to its objective of describing and comprehending a psychosocial phenomenon given a data set of complex personal experiences that are subjective (Richardson *et al.*, 2015). The chosen typology was the multiple case study due to the small number of cases in order to understand better each case in context and reveal new knowledge and meaning related to real world phenomena. According to Yin (2001, p.32) a case study "is an empirical investigation that investigates a contemporary phenomenon within its real-life context, especially when the limits between the phenomenon and its context are not clearly defined". Carneiro (2018, p. 317) adds that "case studies, as a research strategy, would favor more detailed approach, in which the multiple factors in which the study intervenes, as well as relevant intervening agents, would be discussed". It so happens that Yin (2001) and Carneiro (2018) both indicate that a single study may involve and correlate more than one case, broadening the "project" to consider multiple cases.

In this way "each case much be carefully selected in order to predict similar results (a literal replication): or produce contrasting results only for predictable reasons (a theoretical replication)" (Yin, 2001, p. 69). The study of multiple cases allows reliable results to be generated, with study design based on theoretical frameworks in combination with diverse sources of information (observations, interviews, questionnaires, and written instruments, among others) characteristic of the study type in question (Yin, 2001; 2012). It is in this context that the present study inserts itself as a multiple case study, supported by constructed scripts and semistructured interviews, choices of news publications to base the interviews on, audio and video recording of online interviews, and transcription of the participants' words for posterior analysis. If, on one hand, we adopt a stipulated theme (emotional responses of Brazilian adolescents to news shared on digital media about Covid-19), on the other, active participation on the part of a demographic that has intrinsic specificities with regard to their lifestyle and life stage (adolescence) has the capacity to produce contrasting results by manifesting differing emotions with regard to a single theme.

The analysis was based on the theoretical work of Ekman (2011), Damásio (2012), and Bellocchi (2015), with approaches considered appropriate for the study objectives. All of the interviews were recorded and transcribed allowing for meticulous analysis of speech and images based on the framework laid out in the aforementioned references, which is summarized in Figure 1.



Figura 1 – Framework guiding the identification and analysis of participants' emotional responses.



Source: excerpted and adapted from Vianna (2023, p.57-58).

4. RESULTS

The adolescents who participated in this study were polite and willing to engage with the interviewer, and demonstrated that they had prepared for the online meeting through their choice of quiet environments with no other people present during the interviews. We emphasize that all of the participants mentioned during their interviews that they use their cell phone to access the internet,



with eight of them also using stating that they used computers for this purpose. The majority of participants affirmed that they spent approximately four hours (sometimes more) online per day. The most accessed digital media platforms were WhatsApp and Instagram, and Youtube, Twitter, and TikTok were also mentioned. One of the participants cited news websites.

Questions regarding impactful publications on digital media in recent weeks garnered answers related to the war in Ukraine, the Covid-19 pandemic, and a number of themes related to TV and internet celebrities. One of the adolescents commented on a NASA project, another on football, and a third one on a number of items: the death of an author, negotiations regarding a social network and a fake news advertisement.

The participants were, in general, well-informed about the current state of the Covid-19 pandemic at the time of the interview. They reported that their most-accessed social networks were WhatsApp, Instagram, Twitter, and TikTok, the streaming platform YouTube, and in case of Paulo, news sites. They estimated that they spent approximately 4h per day on the internet. Gael, in his interview that began at 7:30pm, checked an application on his phone and reported that he had spent 3 hours and 10 minutes online so far that day. They all stated that they used their personal cell phones to access the internet, and some also cited the computer.

During the interviews, it was possible to identify an array of emotions expressed by the participants, which will be discussed below. During their responses, they remembered and commented on other publications related to Covid-19, and they also reported the emotions that they felt in those moments, which they were able to experience again during the interview. Table 1 presents a summary of the emotions identified as experienced by the participants.

Table 1 - Summary of Emotions identified as experienced by the participants

Participant	1st Article	2nd Article
Paulo	Sadness, fear, contempt, surprise, relief	Contentment, surprise, contempt
Camila	Contempt	Sadness
Gustavo	Contempt and/or aversion	Contempt and/or aversion
Gael	Surprise, anger, relief, contempt	Surprise, sadness, contentment
Júlio	Surprise, relief	Sadness, relief
Thomás	Contempt, sadness	Surprise, sadness
Flávia	Surprise, anger	Surprise
Giovana	Anger, sadness	Fear, sadness, relief
Fabiana	None identified	None identified

Source: Source: excerpted and adapted from Vianna (2023, p. p.66).

It can be observed that the most frequently identified emotions were sadness (Paulo, Camila, Gael, Júlio, Thomás, and Giovana), surprise (Paulo, Gael, Júlio, Thomás, and Flávia), contempt (Paulo,



Camila, Gustavo, Gael, and Thomás) and relief (Paulo, Gael, Júlio and Giovana). Anger (Gael, Flávia, and Giovana), contentment (Paulo and Gael), fear (Paulo and Giovana) and aversion (Gustavo) appeared with lower frequencies.

It is important to emphasize that the emotions that were identified were not always directly related to the shared news. At certain moments after being shown the articles, the participants remembered other publications or past situations and reacted to these memories. Another aspect that merits emphasis is that Damásio's (2012) somatic marker hypothesis permeated the speech and emotions of the participants, in accordance with each individual experience.

Bellocchi's (2015) guidelines oriented the observations of gestures (movements of the thorax, hands, and head), influenced by the varying angles of each participant's camera, as well as oscillations in tone of voice, which were compared to the prevailing tone of each participant during the rapport and socioeconomic questionnaire sections, which did not directly involve emotions. This allowed for distinctions to be made between emotions represented in speech and emotions that were demonstrated across multiple categories, as was the case in Giovana's interview. Giovana, for example, said at one point that she felt "indignant" in regard to the articles, however, her face remained relaxed, even presenting a slight smile. Additional examples of emotional responses will be presented in the following sections.

Sadness was connected life loss due to the virus and to the adolescents' perception of the possibility, not always considered by others, of preventing additional deaths via vaccination. Surprise emerged during remembrance of other news publications on digital media during the pandemic involving situations occasioned by the rapid spread of the virus that were not previously thought to be possible. Thomás, for example, demonstrated sadness regarding successive losses (of time due to restrictions and of lives) during the two years of the pandemic by saying "I think that like, jeez it's already been 2 years and here I am living with this virus around in the air" and "jeez it's been two years since the first woman died in Brazil. That's like, moving". He said this with a withdrawn posture and low tone of voice, which were followed by widened eyes and raised eyebrows, as if the fact of two years having passed represented an unexpected amount of time for the pandemic to linger on for, which were suggestive of surprise.

Contempt was related to other individuals choosing not to follow protective measures aimed at reducing the circulation of the Covid-19 virus. Camila exemplified this dynamic upon being shown the first article with her words "I see some kind of stupid people". After she was requested for explanation, she said "Because they don't get vaccinated", and reported not feeling any emotions in regard to the publication. Despite this claim, she raised her chin and flared her nostrils as she used a pejorative adjective in describing those who choose not to be vaccinated, assuming a superiority position.

Anger was directed towards the attitudes of people who harm others, in the participants' perception, by not taking protective measures, and therefore contributing to higher rates of viral circulation. Flávia did not verbalize her anger, but said "Ah I... it makes me sad, you know, because, instead of these people that don't get vaccinated preventing themselves from getting sick to help the rest of the population, they don't even care. So, if they get it, they'll keep transmitting the virus anyway to



other people.” This statement allows for an inference of anger due to its citation of anger associated characteristics, such as referring to unjust situations that are outside of one’s control, while not presenting any body language suggestive of sadness.

Fear, in turn, appeared upon remembrance of hearing the news of the first Covid-19 death in the country, followed by the increasing numbers of cases and deaths. One participant, Paulo, demonstrated fear when the first article was shared, as it reminded him of the risks posed to society by those who, based on misinformation, do not trust the vaccine. In his words “[...] we got so far and still there are people who want to go back, to not get vaccinated. And... we see social networks potentializing this, you know, a lot, spreading this a lot, more and more people believing in this more, on social networks, WhatsApp groups. I think it’s kind of dangerous like that, it makes me sort of afraid, of what, what might happen in the future, because social networks are here to stay, they’re more and more present in our daily lives”.

Aversion was identified in Gustavo’s interview based on his rejection of the articles presented to him, which he considered predictable. For him, “A little indifference, but the message is kind of obvious [...] it’s fine, right, it makes sense, but I don’t have any other type of thought when I see this type of news [...] like a statistical report I just see and I’m really just indifferent. It’s something that I see like this: people who didn’t get vaccinated will do worse than people who did, that’s what the article is telling me”.

In the case of relief, the adolescents considered the context of the pandemic at the time of the interviews to be more optimistic than it had been previously (due to scientific progress, vaccination, reductions in new cases, and the gradual return to in-person activities). This emotion was exemplified by Júlio who, with a calmer voice and less withdrawn posture than in previous responses, said “And when the article came out saying that it (the number of cases) had gone down, that masks would be optional, I was relieved, right, that this pandemic period was passing, I had worn my mask all the time for 2 years, not being able to leave the house much”.

Contentment occurred due to the participants feeling that recent news was informing them of a more agreeable scenario. Gael expressed contentment with a subtle voice tone and relaxed face while he considered how his experience of the pandemic had been meaningful. He explained “And right after I remember, really, the first death and I remember the news. Then, I start thinking about so much happened between then and now, 2 whole years, that in my life were very important. Even though I stayed home, you know, they weren’t lost years. I don’t think that they were lost years, they were memorable years, that’s it”.

Fabiana’s interview stands out after to the fact that it was not possible to identify her emotional responses because of the ambiguity in thought and emotion that she presented throughout most of the conversation, as well as her difficulty in having her own opinions. She reflected on a family member loss to the virus, which caused her the doubt about the efficacy of vaccines, as well as the opinion of a healthcare professional that contradicted scientifically-founded news regarding Covid-19 prevention, while simultaneously affirming that, in her perception, the first Covid death in Brazil was unjust as the victim didn’t have a chance to be vaccinated.



5. DISCUSSION

These study's results corroborate with recent studies on the subject, which have demonstrated that feelings such as anxiety, depressive symptoms, and increased irritability in adolescents can be intensified as resulting from the pandemic scenario, and that they may lead to psychiatric disorders, especially in those that already presented clinical signs prior to covid-19 (Campos, Silva and Novaes, 2021). In a recent study, Gomes et al. (2021) attempted to identify the emotional responses of high school students to the pandemic. Their data set was constructed via an online survey of students at a public school in Niterói, Rio de Janeiro state. The survey was accessed 77 times, though only 15 adolescents completed the form. The authors affirmed that the primary emotions expressed by these students in response to the pandemic were tiredness, sadness, missing school, friends, and in-person classes, indifference and depression. The authors noted that positive emotions such as joy were also identified (Gomes *et al.*, 2021).

The authors also point out that the inventories applied in this study as exclusion criteria do not indicate that the participants were suffering from clinical anxiety or depression. That being said, they demonstrated sadness (the primary emotion of depression) and fear (characteristic of anxiety), at varying levels, meriting a certain level of alert in regard to this issue.

For this reason, based on their behavior during the interviews, the participants are presumed to possess adequate emotional self-regulation, though that does not exempt them from having experienced the pandemic as a significant time, a phase of transition and discovery, that may reflect on their decision-making processes and future experiences. The fact that 30% of the original 13 adolescents presented severe indices of anxiety and depression is significant. Among the diverse possibilities present in each case, it can be supposed that this percentage may be connected to the emotional consequences of the developments of the covid-19 pandemic, as previously discussed.

Furthermore, it is increasingly common for adolescents to have personal cell phones, which increases their access to personalized digital media and, consequently, molds media algorithms to their individual responses and emotions. With regard to this dynamic, the results of this study demonstrated a natural tendency of the participants in their use of cell phones to access the internet and diverse digital media platforms, which provided opportunities for interactions not only in conversation but also by manifesting ideas and opinions on these networks. A closely related finding was the use of the internet as a method of becoming better informed about new societal trends or current debates, be it through news publications, images, audio or video. The participants estimated that they use digital media for approximately 16.6% of each day, which is highly significant given the other activities that they engage in.

It is noteworthy that the virtual world also represents a category of emotional stimuli and may even be considered the real world by these young people, considering that, even without the social isolation imposed by the pandemic, connectivity is constantly increasing. This is driven primarily by the shift of daily activities, such as the completion of school work, leisure activities (such as online games and various forms of television programming), purchases of items for personal use, finances, contact with family and friends, and other areas have all been facilitated by technological advancements.



According to Deslandes and Coutinho (2020), despite the advantages offered by the internet and the dexterity which adolescents make use of it, they remain vulnerable to the consumption of online information without critical evaluation, as well as intensive internet use in social isolation during the pandemic, which reinforces the necessity of adult mediation in order to help these young people protect themselves from the associated risks of such activities, including self-harm and suicidal ideation, among others.

Additionally, digital media may be seen by adults in another light, due to the fact that they offer a form of interaction, information and entertainment with a tendency to persist and grow over time. Contemporary adolescents, especially, were born into a world already immersed in this reality, and understanding it in order to measure it is important.

6. FINAL CONSIDERATIONS

This study aimed to investigate the emotional responses of adolescents to digital media publications on the topic of Covid-19. As a qualitative study, its goal was to better understand the emotional impacts that the pandemic caused on this demographic. The participant's interviews demonstrated a variety of emotions evoked by contact with news publications shared during the interview.

The analyses demonstrated emotional diversity with the highest frequency emotions being sadness, surprise, contempt, and relief, while anger, contentment, fear, and aversion occurred at lower frequencies. Sadness, for the participants, was related to the life loss caused by the virus, as was demonstrated by the second article (on the theme of the first Covid-19 death in Brazil); as well as by the participants' perception of the possibility, not always considered by the population at large, of preventing more deaths through vaccination, which was occasioned by the first article (which discussed higher mortality rates among the unvaccinated in the state of São Paulo, Brazil). Surprise was related to memories of other news publications during the pandemic evoked by the articles shared during the interview, specifically in terms of previously unimagined situations that occurred due to the rapid spread of the virus and its subsequent developments.

Therefore, the methods of data set construction employed in this study, as well as the analyses performed, were satisfactory, as it was possible to comprehend the emotions experienced by these adolescents in response to widely disseminated subjects on digital media related to Covid-19 and its contextual developments. This article represents a section of a larger project and possesses limitations, such as the impossibility of generalizing emotions responses to digital media publications on Covid-19, primarily due to the limited number of participants, all of whom were part of the middle to upper-class (according to *Associação Brasileira de Empresas de Pesquisa* [2019] criteria), between 15 and 17 years old and from specific regions of the Brazilian Southeast.

In conclusion, suggestions for future investigations include the articulation of this theme with aspects that could prove beneficial for family members, education professionals and healthcare professions that deal directly with adolescents, specifically considering a) preparation and strengthening of professional teams that work with adolescents and their families, demands resulting from the Covid-19 pandemic and other situations that provoke significant changes to their daily life; b) consideration of the emotional aspect of development, as emotional self-regulation, in situations in which physical



and cognitive development are considered important; and c) digital media using as a source of information for read critically in order to foster constructive reflections.

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