



RESEARCH ARTICLE

Commonalities and Specificities in Cognitive and Psychosocial Effects in the Elderly Population During COVID-19 Lockdown in Inúbia Paulista-SP and Ribeirão Preto-SP, Brazil, in 2020-2022

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ABSTRACT

Background: The COVID-19 pandemic has profoundly altered the routine of the Brazilian population, significantly affecting mental health, especially among the elderly, a growing demographic. Therefore, understanding these characteristics is crucial to improving health services.

Aims: To describe and analyze the cognitive (ability to calculate, identify one's own and others' emotions, linguistic skills, attention, concentration, and memory) and psychosocial (sense of humor, feeling of loneliness, fear, worry, and relationships with the environment) effects in individuals over 60 years old in the cities of Inúbia Paulista-SP and Ribeirão Preto-SP, Brazil, during the COVID-19 lockdown between 2020 and 2022.

Methodology: This was a basic, observational, cross-sectional, descriptive-analytical study with a mixed approach. It evaluated 674 elderly individuals (257 in Inúbia Paulista-SP and 417 in Ribeirão Preto-SP, Brazil) using an AD-HOC questionnaire with 46 questions in the last quarter of 2022. The questionnaire covered sociodemographic profile, functionality, cognitive and psychosocial effects, and use of mental health services, excluding health professionals and individuals with severe neurological or psychiatric conditions.

Results: The majority of participants were female. Functionality was similar in both cities, with approximately half of the participants declaring independence and the other half partial dependence, with few declaring total dependence. In Inúbia Paulista, women had a 17% higher probability of having chronic diseases ($p=0.003$), whereas no such association was found in Ribeirão Preto. Cognitive effects were higher in Ribeirão Preto, while Inúbia Paulista showed greater psychosocial effects. In Inúbia Paulista, there was a positive association between gender and cognitive effects ($p<0.05$), with females being more affected. In Ribeirão Preto, there was a significant association between COVID-19 exposure and cognitive effects ($p<0.001$), as well as between chronic diseases and cognitive effects. Both cities showed a significant association between functionality and cognitive/psychosocial effects ($p<0.001$), with dependents being more affected. Although nearly all participants had contact during the lockdown, most experienced loneliness. Only 5% acknowledged the need for mental health services.

Conclusion: Despite differences between cities, identifying common aspects is crucial for developing specific public mental health policies for the elderly, thereby improving their quality of life through prevention and health promotion.

Keywords: COVID-19; elderly; social lockdown; functionality; public health

Introduction

On January 30, 2020, the World Health Organization (WHO) declared that the outbreak of a new coronavirus (named COVID-19) constituted a Public Health Emergency of International Concern, the highest level of alert from the Organization according to the International Health Regulations (WHO website)^{1,2}. This decision aimed to enhance global coordination, cooperation, and solidarity to stop the spread of the virus.

Thus, the WHO declared the pandemic of the new coronavirus on March 11, 2020, by which point the disease had already reached 114 countries and infected 118,000 people, with 4,291 deaths³. It is important to highlight that the contemporary, globalized world is characterized (from an integration perspective) by increased flows of people, goods, capital, and services; technical networks of spaces are increasingly compressed by time, that is: biopolitics, a term used by philosopher Paul Preciado, which indicates that the same globalization that integrates ends up fragmenting and producing selectivity in the most present flows^{4,5}.

In addition to this, nosophobia or the fear of contracting the disease adds to the situation, affecting both healthcare professionals and the general population, particularly those over 60 years old, characterized by a recurrent and persistent fear, unlike hypochondria, which not only presents physical symptoms but also cognitive, emotional, and behavioral symptoms, with a sense of insecurity in many aspects of life, from individual to collective perspectives, from the everyday functioning of society to changes in interpersonal relationships⁶.

In line with the aforementioned, the health systems of countries have collapsed, healthcare professionals have become exhausted from long hours of work, and one of the most effective methods to control the disease, which is social distancing, has a considerable impact on the mental health of the population^{7,8}.

Adding to this is confinement, which can trigger numerous other emotional, psychosocial, and cognitive effects, such as feelings of sadness, confusion about the notion of time and space, memory loss, mental laziness, irritability with oneself and with those one lives with, difficulty sleeping, loss of appetite, mood swings, and stress⁹.

Studies show that around 30% of people had some common mental health disorder (non-disabling) before the pandemic began – a number that rose to over 40% during the pandemic, according to the WHO, and could reach up to 50% after it, representing a significant public health problem (both currently and especially in the coming years)¹⁰.

Aging, once considered an isolated phenomenon, is now part of the reality of most societies. The world is aging. It is so true that it is estimated that by 2050 there will be around two billion people aged sixty and over in the world, most of them living in developing countries such as Brazil. According to WHO, by 2030 this population will be larger than those aged 0 to 14, thus becoming the fourth largest elderly population globally¹¹.

The greatest challenge in caring for the elderly is contributing to the fact that, despite the progressive limitations that may occur, possibilities can be rediscovered and they can live their own lives with the highest possible quality. This possibility increases as society considers the family and social context and recognizes the potential and value of older people. Therefore, part of the difficulties faced by the elderly is more related to a [de]culture that devalues and limits them¹².

In this sense, this article aims to present the cognitive and psychosocial factors experienced by elderly individuals over 60 years old, in the context of the COVID-19 pandemic, in two geographically distinct cities in the interior of São Paulo, Brazil, with the objective of describing such common and idiosyncratic characteristics for the reformulation (or even formulation) of specific public policies on this issue.

Methodology

This study is an academic and scientific work of a basic nature, observational, with epidemiological analysis, descriptive-analytical (descriptive correlational) objective, cross-sectional design, and a mixed method (qualitative-quantitative) approach involving individuals over 60 years old in the cities of Inúbia Paulista-SP and Ribeirão Preto-SP, Brazil, in the last quarter of 2022.

Inúbia Paulista-SP has approximately 3,800 inhabitants, with 725 elderly individuals, while Ribeirão Preto-SP has around 710,000 inhabitants, with 113,652 elderly individuals. Thus, the sample size for each municipality was calculated, resulting in a sample of 257 elderly individuals from Inúbia Paulista-SP and 417 elderly individuals from Ribeirão Preto-SP (with a 95% confidence level and a 5% margin of error).

Inclusion criteria included individuals aged 60 years or older (from March 11, 2020, the start date of the COVID-19 pandemic), who had or had not contracted COVID-19, and were in physical and mental conditions to answer the surveys. Exclusion criteria were individuals under 60 years old as of March 11, 2020, elderly individuals who are healthcare professionals, those in institutionalized situations, or those with neurological/psychological conditions that would prevent them from answering the survey due to cognitive issues (they could have a mild preexisting physical and/or mental condition but not to the extent that it would prevent them from completing the survey), and those who did not consent to sign the Informed Consent Form.

An interview was conducted (where participants had their questions about the Informed Consent Form answered before signing it) and four questionnaires with 46 questions were administered. These questionnaires assessed sociodemographic characteristics (1), the application of the Lawton and Brody Index (a validated and adapted instrument for the Brazilian reality), evaluating the elderly individual's ability to perform instrumental activities of daily living, and their degree of independence and autonomy (2); a

semi-structured subquestionnaire titled 'Cognitive and Psychosocial Effects of Confinement in Elderly People,' an instrument already validated by the Fundació Salut i Envel·liment of the Universitat Autònoma de Barcelona, Spain, adapted to the Brazilian context, with 24 questions, mostly with Likert scale responses, specifically evaluating the potential cognitive and psychosocial effects on the elderly in the context of the COVID-19 pandemic (3); and an evaluation of follow-up with any mental health services (4).

Finally, responses were automatically organized and stored in Microsoft Excel® spreadsheets, with statistical analyses performed using Jamovi® software. The Kolmogorov-Smirnov test was used to determine the parametricity of quantitative data ($n > 20$), showing abnormal distribution.

There are no conflicts of interest declared by the authors of this work. This research was approved by the Municipal Health Secretariats of Inúbia Paulista-SP and Ribeirão Preto-SP and submitted to Plataforma Brasil (a governmental platform that manages research involving human subjects). The CONEP (National Ethics Committee in Research) selected the Ethics Committee of the Centro Universitário Barão de Mauá, Ribeirão Preto-SP, which reviewed and approved this work, as evidenced by the CAAE code 55625822.2.0000.5378, opinion number 5.588.847, dated August 18, 2022.

Results

Regarding gender, Inúbia Paulista-SP reported 59.53% of the sample identifying as female and 40.46% as male, while Ribeirão Preto-SP reported 56.11% female and 43.88% male.

In terms of chronic illnesses, Inúbia Paulista-SP reported that 70.03% of the sample declared having such illnesses and 29.96% denied, while Ribeirão Preto-SP reported 66.90% with chronic illnesses and 33.10% denying. In both municipalities, the main chronic illnesses are cardiovascular, followed by endocrine and musculoskeletal conditions.

When it comes to COVID-19 infection, the Inúbia Paulista-SP sample reported 'YES' in 38.91% (with 'NO' in 61.08%), and in Ribeirão Preto-SP, 33.10% answered 'YES' (with 'NO' in 66.90%). Regarding vaccination, 92.60% of the Inúbia Paulista-SP

sample reported having completed the vaccination scheme in 2021, and 84.43% in 2022; 88.72% in Ribeirão Preto-SP, and 84.17% in 2022. These results, presented so far, are summarized in Table 1.

Table 1 – Gender, presence of chronic illnesses, COVID-19 infection, and vaccination (complete scheme) in 2021 and 2022, in Inúbia Paulista-SP and Ribeirão Preto-SP

Aspect	Inúbia Paulista-SP	Ribeirão Preto-SP
Gender		
Female	59.53%	56.11%
Male	40.46%	43.88%
Chronic Illnesses		
Has	70.03%	66.90%
Does not have	29.96%	33.10%
Main Chronic Illnesses	Cardiovascular, Endocrinological, Musculoskeletal	Cardiovascular, Endocrinological, Musculoskeletal
COVID-19 Infection		
Yes	38.91%	33.10%
No	61.08%	66.90%
Vaccination (2021)		
Complete scheme	92.60%	88.72%
Vaccination (2022)		
Complete scheme	84.43%	84.17%

Source: Author's own elaboration, 2023

On the topic of a possible statistical association between gender and the presence of chronic diseases, the Chi-Square Test revealed a statistically significant association in the Inúbia Paulista-SP sample ($p = 0.003$), indicating that men

are approximately 17% less likely to have a chronic disease compared to women, as shown in Table 2. In contrast, the Ribeirão Preto-SP sample did not show a significant association ($p = 0.103$).

Table 2 - Statistical Association between Gender and Chronic Diseases, in the Inúbia Paulista-SP Sample

Gender		Chronic Illness		Total	Odds Ratio	p-value
		Yes	No			
Female	Observed	118	35	153	0.826	0.003
	Expected	107.2	45.8	153		
	% in Row	77.1%	22.9%	100.0%		
Male	Observed	62	42	104		
	Expected	72.8	31.2	104		
	% in Row	59.6%	40.4%	100.0%		
Total		180	77	257		
	Expected	180.0	77.0	257		
	% in Row	70.0%	30.0%	100.0%		

Source: Author's own elaboration, 2023

About the possible cognitive effects during the COVID-19 lockdown period, the results from the two cities were grouped here as 'no' (responses given as 'not at all') and 'yes' (all responses given as 'a little', 'somewhat', 'quite a bit', and 'a lot'). After performing a statistical analysis of this sub-questionnaire by city, with 8 variables, the following results were found: Inúbia Paulista-SP: α Cronbach = 0.959; Ribeirão Preto-SP: α Cronbach = 0.970. The analysis highlights that a significant proportion of residents in both Inúbia Paulista-SP and Ribeirão Preto-SP perceive deterioration in various cognitive functions.

In Inúbia Paulista, 16.74% of participants report a decline in orientation, 19.07% perceive a deterioration in memory, and 15.18% notice worsening in attention and concentration. Additionally, 17.13% feel they perform tasks more slowly, and 17.13% also have difficulties finding

words and making plans. A decrease in the ability to identify emotions is perceived by 21.40% of residents, and 12.85% notice a deterioration in calculation ability. Language ability is seen as compromised by 10.12% of participants. In Ribeirão Preto, the perception of cognitive deterioration is even more pronounced. Worsening in orientation is noted by 30.70% of participants, while 32.14% perceive a decline in memory. Deterioration in attention and concentration is observed by 29.50% of residents, and 30.46% feel they perform tasks more slowly. Difficulties in finding words and making plans are reported by 30.46%, and a decrease in the ability to identify emotions is perceived by 28.30%. Additionally, 25.66% notice a decline in calculation ability, and 25.90% experience difficulties in language ability – these data are summarized in Table 3.

Table 3 – Presence of Cognitive Effects in the Populations of Inúbia Paulista-SP and Ribeirão Preto-SP, 2020-2022

Cognitive Aspect	Inúbia Paulista (%)	Ribeirão Preto (%)
Worsening in orientation	16.74%	30.70%
Deterioration in memory	19.07%	32.14%
Worsening in attention and concentration	15.18%	29.50%
Performing tasks more slowly	17.13%	30.46%
Difficulty finding words and making plans	17.13%	30.46%
Decreased ability to identify emotions	21.40%	28.30%
Deterioration in the ability to calculate	12.85%	25.66%
Compromised linguistic ability	10.12%	25.90%

Source: Author's own elaboration, 2023

In relation to a possible statistical association between gender and cognitive effects, the Mann-Whitney test was conducted. In the Inúbia Paulista-SP sample, a significant association was found in all dependent variables except for memory deterioration. Despite the statistical significance, the descriptive analysis did not show changes in the quartiles, so deciles were used, revealing that the female gender is more associated with cognitive effects in the 9th decile, as noted in Table

4. In contrast, no statistically significant association was found in the evaluated variables in Ribeirão Preto-SP.

Table 4 – Association between Gender and Cognitive Effects during the COVID-19 Pandemic in the Inúbia Paulista-SP Sample

Cognitive Effect	Gender	N	Percentile				p
			25th	50th	75th	90th	
Worsening in orientation	Female	153	1.00	1.00	1.00	2.00	0.008
	Male	104	1.00	1.00	1.00	1.00	
Worsening in memory	Female	153	1.00	1.00	1.00	2.80	0.052
	Male	104	1.00	1.00	1.00	2.00	
Worsening in attention and concentration	Female	153	1.00	1.00	1.00	2.00	0.010
	Male	104	1.00	1.00	1.00	1.00	
Performing tasks more slowly	Female	153	1.00	1.00	1.00	2.00	<.001
	Male	104	1.00	1.00	1.00	1.00	
Difficulty finding words and making plans	Female	153	1.00	1.00	1.00	2.00	0.004
	Male	104	1.00	1.00	1.00	1.00	
Decreased ability to identify emotions	Female	153	1.00	1.00	2.00	3.00	0.002
	Male	104	1.00	1.00	1.00	2.00	
Worsening in the ability to calculate	Female	153	1.00	1.00	1.00	2.00	0.014
	Male	104	1.00	1.00	1.00	1.00	
Worsening in linguistic ability	Female	153	1.00	1.00	1.00	2.00	0.002
	Male	104	1.00	1.00	1.00	1.00	

Source: Author's own elaboration, 2023

Concerning the statistical association between chronic illnesses and cognitive effects, the Mann-Whitney test showed that in Inúbia Paulista-SP, significance was found only for 'memory

deterioration' ($p = 0.035$) and 'deterioration of calculation ability' ($p = 0.021$). In Ribeirão Preto-SP, a significant association was found in all analyzed variables ($p < 0.05$), as noted in Table 5.

Table 5 – Statistical Association between the Presence of Chronic Illness and Cognitive Effects in the Ribeirão Preto-SP Sample

Cognitive Effect	Chronic Illness	N	Percentile			p-value
			25th	50th	75th	
Deterioration in Orientation	Yes	279	1.00	1.00	2.00	0.011
	No	138	1.00	1.00	1.00	
Deterioration in Memory	Yes	279	1.00	1.00	2.00	0.001
	No	138	1.00	1.00	1.00	
Deterioration in Attention and Concentration	Yes	180	1.00	1.00	2.00	0.033
	No	77	1.00	1.00	1.00	

Cognitive Effect	Chronic Illness	N	Percentile			p-value
			25th	50th	75th	
Performing Tasks More Slowly	Yes	180	1.00	1.00	2.00	< .001
	No	77	1.00	1.00	1.00	
Difficulty Finding Words and Making Plans	Yes	180	1.00	1.00	2.00	< .001
	No	77	1.00	1.00	1.00	
Decrease in Ability to Identify Emotions	Yes	180	1.00	1.00	2.00	0.001
	No	77	1.00	1.00	1.00	
Deterioration in Calculation Ability	Yes	180	1.00	1.00	2.00	0.004
	No	77	1.00	1.00	1.00	
Deterioration in Linguistic Ability	Yes	180	1.00	1.00	2.00	0.002
	No	77	1.00	1.00	1.00	

Source: Author's own elaboration, 2023

Relating to a possible association between chronic illnesses and functionality in the two samples, the Chi-square test showed statistically significant

associations in both samples: Inúbia Paulista-SP ($p = 0.029$) and Ribeirão Preto-SP ($p = 0.040$), as noted in Table 6.

Table 6 – Statistical Association Between the Presence of Chronic Illness and Functionality in Older Adults in the Ribeirão Preto-SP Sample

Chronic Illness		Functionality			Total
		PARTIALLY DEPENDENT	INDEPENDENT	DEPENDENT	
Yes	Observed	150	127	2	279
	Expected	139.2	138.5	1.338	279
	% within	53.8%	45.5%	0.7%	100.0%
No	Observed	58	80	0	138
	Expected	68.8	68.5	0.662	138
	% within	42.0%	58.0%	0.0%	100.0%
Total	Observed	208	207	2	417
	Expected	208.0	207.0	2.000	417
	% within	49.9%	49.6%	0.5%	100.0%

Source: Author's own elaboration, 2023

Pertaining a possible association between functionality and cognitive effects, the results for Inúbia Paulista-SP showed a statistically significant association in all 8 assessed points ($p < 0.05$). The median for patients who identified as 'dependent' was higher than the other medians, indicating that

these patients experienced more pronounced cognitive effects. There was no significant statistical difference between the 'partially dependent' and 'independent' categories. The data related to this discussion for Inúbia Paulista-SP are fully represented in Table 7.

Table 7 – Statistical Association between Functionality and Cognitive Effects in the Inúbia Paulista-SP Sample

Cognitive Decline	Functionality	N	Percentile			p
			25th	50th	75th	
Decline in Orientation	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	3.00	3.00	3.00	
Decline in Memory	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	<0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	3.25	3.50	3.75	
Decline in Attention and Concentration	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	<0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	3.25	3.50	3.75	
Performing Tasks More Slowly	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	<0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	2.50	3.00	3.50	
Difficulty Finding Words and Making Plans	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	<0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	2.50	3.00	3.50	
Decrease in Ability to Identify Emotions	PARTIALLY DEPENDENT	129	1.00	1.00	2.00	0.003
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	1.00	1.00	1.00	
Decline in Calculating Ability	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	<0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Decline in Linguistic Ability	PARTIALLY DEPENDENT	129	1.00	1.00	1.00	<0.001
	INDEPENDENT	126	1.00	1.00	1.00	
	DEPENDENT	2	2.75	3.50	4.25	

Source: Author's own elaboration, 2023

For Ribeirão Preto-SP, similar results were observed, with a statistically significant association in all 8 assessed points ($p < 0.05$). Again, the median for patients who identified as 'dependent' was higher than the other medians, suggesting

more pronounced cognitive effects for this group. There was no statistical difference between the 'partially dependent' and 'independent' categories. The data specific to Ribeirão Preto-SP are detailed in Table 8.

Table 8 – Statistical Association between Functionality and Cognitive Effects in the Ribeirão Preto-SP Sample

Cognitive Decline	Functionality	N	Percentile			p
			25th	50th	75th	
Decline in Orientation	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	<0.001
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Decline in Memory	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	<0.001
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Decline in Attention and Concentration	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	<0.001
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Performing Tasks More Slowly	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	<0.001
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Difficulty Finding Words and Making Plans	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	<0.001
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Decrease in Ability to Identify Emotions	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	<0.001
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	
Decline in Calculating Ability	PARTIALLY DEPENDENT	208	1.00	1.00	2.00	<0.001

Cognitive Decline	Functionality	N	Percentile			p
			25th	50th	75th	
Decline in Linguistic Ability	INDEPENDENT	207	1.00	1.00	1.00	<0.001
	DEPENDENT	2	2.00	3.00	4.00	
	PARTIALLY DEPENDENT	208	1.00	1.00	3.00	
	INDEPENDENT	207	1.00	1.00	1.00	
	DEPENDENT	2	2.00	3.00	4.00	

Source: Author's own elaboration, 2023

In terms of the potential psychosocial effects during the confinement period due to the COVID-19 pandemic, for ease of comparison, the results from the two cities have been grouped here as 'no' (responses given in the survey as 'nothing') and 'yes' (all responses given as 'a little', 'somewhat', 'quite a bit', and 'a lot'), as shown in Table 18. After performing a statistical analysis of this sub-questionnaire by city, with 9 variables, the following results were found: Inúbia Paulista-SP: Cronbach's $\alpha = 0.784$; Ribeirão Preto-SP: Cronbach's $\alpha = 0.845$.

As for psychosocial effects, the data analysis from Inúbia Paulista-SP and Ribeirão Preto-SP reveals that residents of both cities experience a range of emotional and social challenges, with notable differences in perceptions between the two locations. In Inúbia Paulista, 78.60% of participants fear that their health will be affected, and 99.22% express a desire to cooperate and be supportive. Feelings of sadness due to isolation and limitation are experienced by 82.49% of residents, while

84.05% feel sad about not being able to spend time with others. Additionally, 73.54% of participants want to investigate and stay informed, and 38.52% use humor to adapt to the situation. Anxiety about the inability to predict the future is felt by 80.16%, and 70.03% suffer from loneliness or feel alone. Finally, 82.49% fear they will not be able to endure the prolonged confinement. In Ribeirão Preto, 68.59% of participants fear that their health will be affected, and 84.90% want to cooperate and be supportive. Feelings of sadness due to isolation and limitation are experienced by 55.88% of residents, and 67.15% feel sad about not being able to share time with others. The desire to investigate and stay informed is reported by 79.14%, while 72.43% use humor to adapt. Anxiety about the inability to predict the future is felt by 62.59%, and 52.28% suffer from loneliness or feel alone. Finally, 56.11% fear they will not be able to endure the prolonged confinement—these data are presented in Table 9.

Table 9 – Presence of Psychosocial Effects in the Populations of Inúbia Paulista-SP and Ribeirão Preto-SP, 2020-2022

Psychosocial Effect	Inúbia Paulista-SP	Ribeirão Preto-SP
Fear of health being affected	78.60%	68.59%
Desire to cooperate and be supportive	99.22%	84.90%
Sadness from being isolated and restricted	82.49%	55.88%
Sadness from not being able to spend time with others	84.05%	67.15%
Desire to explore and stay informed	73.54%	79.14%
Use of humor to adapt	38.52%	72.43%
Anxiety about not being able to predict the future	80.16%	62.59%
Loneliness or feeling alone	70.03%	52.28%
Fear of not being able to endure the prolonged confinement	82.49%	56.11%

Source: Author's own elaboration, 2023

With respect to a potential association between functionality and psychosocial effects, Inúbia Paulista-SP did not show significant associations, except for the variable "wanted to investigate and stay informed." In Ribeirão Preto-SP, significant associations were found in seven psychosocial effects, such as "fear of health being affected," which was related to a higher median in the "dependent"

state, and feelings of sadness, anxiety, and loneliness that were associated with a "partially dependent" state. Additionally, the use of humor showed equal and higher medians in the "independent" and "partially dependent" states. Multiple comparisons confirmed significance in the cases detected by the Kruskal-Wallis test, as shown in Table 10.

Table 10 – Statistical Association between Functionality and Psychosocial Effects in the Ribeirão Preto-SP Sample, 2020-2022

Psychosocial Effect	Functionality	N	Percentile			p
			25th	50th	75th	
Fear of Health Being Affected	PARTIALLY DEPENDENT	208	1.75	3.00	4.00	<.001
	INDEPENDENT	207	1.00	3.00	3.00	
	DEPENDENT	2	2.75	3.50	4.25	
Desire to Cooperate or Be Supportive	PARTIALLY DEPENDENT	208	3.00	3.00	4.00	0.069
	INDEPENDENT	207	2.00	3.00	3.00	
	DEPENDENT	2	2.25	2.50	2.75	
Sadness from Being Isolated and Limited	PARTIALLY DEPENDENT	208	1.00	2.00	3.00	<.001
	INDEPENDENT	207	1.00	1.00	3.00	
	DEPENDENT	2	1.25	1.50	1.75	
Sadness from Not Being Able to Share Time	PARTIALLY DEPENDENT	208	2.00	3.00	3.00	<.001
	INDEPENDENT	207	1.00	2.00	3.00	
	DEPENDENT	2	1.25	1.50	1.75	
Desire to Investigate and Stay Updated	PARTIALLY DEPENDENT	208	2.00	3.00	5.00	0.118
	INDEPENDENT	207	1.00	3.00	5.00	
	DEPENDENT	2	2.00	3.00	4.00	
Using Humor to Adapt	PARTIALLY DEPENDENT	208	2.00	3.00	3.00	0.024
	INDEPENDENT	207	1.00	3.00	3.00	
	DEPENDENT	2	1.00	1.00	1.00	
Anxiety About Not Being Able to Predict the Future	PARTIALLY DEPENDENT	208	1.00	3.00	3.00	<.001
	INDEPENDENT	207	1.00	2.00	3.00	
	DEPENDENT	2	1.25	1.50	1.75	
Suffering from Loneliness or Feeling Alone	PARTIALLY DEPENDENT	208	1.00	2.00	3.00	<.001
	INDEPENDENT	207	1.00	1.00	3.00	
	DEPENDENT	2	1.25	1.50	1.75	
Fear of Not Being Able to Endure Prolonged Confinement	PARTIALLY DEPENDENT	208	1.00	2.00	3.00	<.001
	INDEPENDENT	207	1.00	1.00	3.00	
	DEPENDENT	2	1.00	1.00	1.00	

Source: Author's own elaboration, 2023

Considering the number of people with whom the samples lived during the COVID-19 pandemic lockdown, Inúbia Paulista-SP shows that 10.89% did not live with anyone personally, while Ribeirão Preto-SP had 14.39%.

In view of staying mentally active during the COVID-19 pandemic lockdowns, the most common response in both cities' samples was 'reading (newspapers/magazines, books, tablets, phones...)' although there was a difference between the two samples: Inúbia Paulista-SP: 83.65%; Ribeirão Preto-SP: 50.60%).

Finally seeking mental health care, only 3.89% in Inúbia Paulista-SP and 7.43% in Ribeirão Preto-SP sought such care. Despite this, 84.43% in Inúbia Paulista-SP and 75.77% in Ribeirão Preto-SP do not consider it necessary to start or continue mental health follow-up, although the results suggest that more support is needed. Concerning the preparedness of mental health services, 25.29% in Inúbia Paulista-SP and 44.12% in Ribeirão Preto-SP believe they are 'fully'

prepared. Criticisms include a lack of professionals, poor infrastructure, insufficient materials, high demand, inadequate resources, and government corruption.

Discussion

In the two cities evaluated, more than half of the sample identified as female, with a 3.4% difference between them ($p < 0.001$). This pattern reflects the feminization of old age observed globally, especially in Brazil, where there are more women in the elderly population, particularly at advanced ages¹³. Women, although they live longer, often have a lower quality of life due to factors such as lower economic security and education, as well as higher rates of chronic diseases^{14,15}. Men face vulnerabilities such as limited support networks and the need for self-care¹⁶, highlighting the importance of a gender-based approach in Active Aging policies, which promote health, safety, and continuous learning for all^{17,18}.

About comorbidities, most samples in the evaluated cities reported chronic diseases, with

prevalences similar to international studies indicating 65-75%^{19,20,21,22}. Non-communicable chronic diseases (NCCDs) account for 70% of global deaths, with 38 million deaths annually, 16 million of which are premature, affecting mainly low- and middle-income countries^{23,24}. In Brazil, in 2014, 10.1% of hospitalizations were due to circulatory system diseases, with a high incidence in individuals over 60²⁵. Reducing NCCDs is crucial for global development due to their high socioeconomic cost^{26,27}. The study's data align with the 2013 report from the Brazilian Ministry of Health, which shows a higher prevalence of comorbidities among women. This may be due to women seeking more medical care and living longer, accumulating more health problems. However, further research is needed to explore additional factors such as genetic and immunological aspects²⁸.

Older adults are highly vulnerable to social isolation, which can worsen their health and functionality due to reduced mobility and the effects of aging^{29, 30}. During the COVID-19 pandemic, lockdowns exacerbated these issues as isolation further limited their physical activity³¹. Despite this, most elderly individuals remain independent in Instrumental Activities of Daily Living (IADLs), consistent with previous studies highlighting their functionality³². Functional decline observed should not be attributed to normal aging but to common disabilities in this population³³.

In view of cognitive effects, the most frequent cognitive symptom identified in the samples from both cities was worsening memory, while the least reported symptoms were deterioration in calculation and linguistic abilities. These findings align with global literature, which also highlights memory deterioration as a common symptom among older adults^{34,35}. Although the study did not assess the patients' prior neurological state, general memory worsening was observed, confirming that this mental process is often affected by multiple factors such as attention, motivation, emotional load, and lifestyle³⁶. In this

context, other studies, such as those by Menze et al. (2022) and Paolini et al. (2021), also report deterioration in memory and other cognitive functions during this period. Despite differences in results based on factors such as gender and occupational activity, there is consensus that episodic and prospective memory are more vulnerable to aging, while vocabulary may improve with age^{37,38,39,40}. The complexity of the relationship between aging and memory highlights the need to consider various factors in cognitive function assessment, especially in the pandemic context. Cognitive decline in older adults, which includes memory loss, judgment, and visuospatial skills, affects their independence and quality of life⁴¹. This study confirms previous findings by Machado et al. (2007) and Dourado et al. (2005), and Silva et al. (2022) reveals that COVID-19 lockdown exacerbated these effects, especially in dependent older adults, with greater impact on women and their ability to perform daily activities^{42,43,44}.

Considering the statistical association between gender and cognitive effects, as seen in Inúbia Paulista-SP, according to Kiely, Brady, and Byles (2019), older women are more likely to suffer from mental disorders compared to men, although the gender gap narrows with age⁴⁵. However, older men face higher mortality risks related to poor mental health, such as suicide, although these patterns vary by country and social context. Studies on the impact of the COVID-19 pandemic on cognitive function also show mixed results: Barber and Kim (2021) found that men experienced fewer cognitive effects during the pandemic, while Silva et al. (2021) found similar cognitive decline between genders^{46,47}. Differences in these findings may be due to cultural norms, gender roles, and coping styles, but there is limited research exploring these explanations and gender dynamics in depth, especially in non-binary populations^{48,49}.

About the association between cognitive effects and chronic diseases, global literature is not unanimous that patients' chronic diseases may be related to cognitive effects that appear (or are

exacerbated) during the COVID-19 lockdown—there are even few studies in this area (and those that do address the topic only consider pre-existing mental health comorbidities, not physical comorbidities). Souza Filho et al. (2021) found no statistically significant association, stating that there was no relationship between the studied variables⁵⁰. Brooks (2021) argues that there is a positive relationship between pre-existing comorbidities (in this case, mental health issues like Parkinson's disease) and the emergence of new cognitive effects (in addition to worsening existing ones)⁵¹. Souza et al. (2021) discuss a possible relationship between comorbidities and cognitive effects but suggest that older adults with comorbidities might have lower functionality (or, at least, engage in less physical activity), indicating the need for further research in this area⁵².

With reference to psychosocial effects, social isolation during the COVID-19 pandemic has had a significant impact on the mental health of older adults, causing anxiety, sadness, and loneliness due to confinement and concerns about illness^{53,54,55}. Global studies have documented an increase in symptoms such as stress and depression in various regions, highlighting that loneliness and uncertainty contribute to notable emotional deterioration^{56,57,58,59}. The pandemic has exacerbated immunological aging, intensifying older adults' emotional vulnerability and exacerbating feelings of uselessness and anxiety^{60,61}. However, some studies suggest that older adults may have experienced fewer psychosocial effects than younger people, possibly due to their greater resilience and life experience^{62,63,64}. The coping capacity developed over the years might offer better emotional regulation and strategies for handling stressful events^{65,66}, which could explain the observed differences in outcomes among the various studied samples.

As it pertains to the association between functionality and psychosocial effects in the two studied cities, as observed, Inúbia Paulista-SP showed a significant association only for the

variable 'wanted to investigate and update', while Ribeirão Preto found important correlations with fear of health issues, sadness, and loneliness, especially in individuals with different levels of dependency. These findings underscore that the relationship between functionality and psychosocial effects may vary depending on the context and individual functionality, reinforcing the importance of considering these factors when assessing the impact of isolation. The variables 'wanting to cooperate,' 'investigate and stay updated,' and 'using humor' did not show significant correlations in some analyses, aligning with previous studies that highlight a relationship between loneliness, anxiety, and depression^{67,68}.

As observed, regarding the number of people with whom participants lived during the COVID-19 lockdown, Inúbia Paulista-SP and Ribeirão Preto-SP showed low percentages of individuals who did not live with anyone, although these results were lower than those found by Emerson (2020)⁵⁷. Despite the majority of participants in both cities reporting contact with family and friends, family remains crucial for the well-being of older adults, providing support and intimacy⁶⁹. However, loneliness and social isolation are serious issues that can affect older adults' physical and mental health, accelerating problems such as cardiovascular diseases and mortality^{70,71}. Social distancing, as observed, should not be confused with loneliness, which is a deeper and more subjective experience, intensified by liquid modernity and the lack of meaningful connections^{72,73}.

Regarding staying mentally active during the COVID-19 lockdown, reading was the most commonly reported activity by participants in Inúbia Paulista-SP (83.65%) and Ribeirão Preto-SP (50.60%), highlighting its importance for cognitive health by improving memory and neuronal synapses^{74,75}. However, literacy remains a significant challenge, especially for older adults, with a 19.3% illiteracy rate in this population⁷⁶. Activities such as reading, manual work, and spirituality played crucial roles during the

lockdown, helping to maintain mental and emotional well-being, although excessive screen use and lack of physical activity were also identified as significant concerns^{77,78}. Spirituality and religion provided emotional support and resilience during the pandemic, aligning with international findings on the positive impact of these practices on mental health^{79,80}. Additionally, concerns about the health of loved ones and economic situations also emerged as relevant topics among older adults, highlighting the complexity of their experiences during the pandemic⁸¹.

As seen in the data presented in the Results, during the COVID-19 pandemic, only 3.89% of residents in Inúbia Paulista-SP and 7.43% in Ribeirão Preto-SP sought mental health care, while the majority in both cities, 84.43% and 75.77%, respectively, did not consider specialized follow-up necessary despite the evident need. These data align with findings from the IPSOS Institute, which indicate that although Brazil highly values mental health, 13% believe investing in these services is a waste⁸². Furthermore, the evaluation of mental health services showed that although a significant number consider the services to be 'fully' prepared, criticisms include lack of professionals, inadequate infrastructure, and high demand, reflecting a widespread perception of neglect and lack of investment in the field, as also reported by Costa, Colugnati, and Ronzani (2015)⁸³.

Conclusion

During the COVID-19 pandemic, both common factors and specific issues in public policies related to mental health and elderly care were revealed, as observed in the two cities chosen for this study. On a general level, the health crisis exposed weaknesses in governmental capacity to handle emergencies and a fragmentation in policy implementation, affecting the accessibility and quality of health services⁸⁴. Despite the high valuation of mental health in Brazil, there is a notable discrepancy between the recognition of the need for specialized follow-up and the reality of insufficient resources and support⁸².

Specifically, in Inúbia Paulista-SP and Ribeirão Preto-SP, there was low uptake of mental health care during the pandemic, with only 3.89% and 7.43% of the sample, respectively, seeking such care. Most participants did not consider it necessary to initiate or continue specialized follow-up, despite an evident need, as shown in this article. The pandemic also impacted the elderly, who exhibited a decline in vaccination adherence and faced challenges in managing chronic diseases due to resource reallocation^{85,86}.

In terms of functionality, both Inúbia Paulista-SP and Ribeirão Preto-SP showed that older adults fluctuated between independence and partial dependence, underscoring the need to strengthen social bonds and community support⁸⁷. The cognitive and psychosocial effects of the pandemic, such as memory impairment, anxiety, and loneliness, were prevalent, highlighting the importance of addressing these aspects in public policy formulation to improve the well-being of older adults^{49,88}.

These data indicate that, while there are common challenges such as the need for better access to services and support for the elderly, public policies must be adaptable to address the specificities of each population and context. Attention should be focused on integrating resources and promoting mental health and well-being among the elderly, adjusting strategies to the specific needs of each group and region to more effectively address future crises^{87,89}. It is suggested to expand this study to other age groups to understand similar characteristics in mental health (or even other aspects) across different populations.

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