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Vocal and emotional aspects related to restriction of singing activities in amateur choralists

Aspectos vocais e emocionais relacionados à restrição das atividades de canto em coralistas amadores

Yasmim Pereira de Andrade[1], *Maiara Alves do Nascimento*[2], *Anna Alice Almeida*[1], *Priscila Oliveira*[1]

ABSTRACT

Purpose: To investigate the association between measures of voice handicap, symptoms of common mental health disorders and the restriction of singing activities that occurred during the Covid-19 pandemic in amateur choristers. **Methods:** This is a cross-sectional, analytical, descriptive and quantitative study. To collect data were used an initial characterization questionnaire, the Modern Singing Handicap Index (MSHI) protocol and the SRQ-20, an adaptation of the Self Reporting Questionnaire, all of which were made available online. The research sample consisted of 46 participants belonging to amateur choirs from two higher education institutions. **Results:** The mean total score for the MSHI and SRQ-20 were high and were positively correlated with each other. There was no difference between the MSHI and SRQ-20 scores between individuals who self-reported Covid-19 infection or not. Individuals who stated that the answers offered in the survey were influenced by the social restrictions caused by the pandemic had higher scores than those who did not make this statement. There was no correlation with singing time and voice handicap and the presence of symptoms of mental health disorders, measured by the MSHI and SRQ-20, respectively. Choristers who maintained their singing activities individually or collectively showed less vocal and emotional damage. **Conclusion:** Amateur choristers reported voice disadvantage and common mental health disorders possibly related to social restrictions caused by the Covid-19 pandemic. The observed rates, however, do not seem to be associated with the virus infection itself, but with the limitations imposed by social restrictions during the pandemic period.

Keywords: Voice; Singing; Covid-19; Self-evaluation; Mental disorders

RESUMO

Objetivo: Investigar a associação entre medidas de desvantagem vocal, sintomas de transtornos mentais comuns e a restrição das atividades de canto ocorrida durante a pandemia de Covid-19 em coralistas amadores. **Métodos:** Estudo descritivo, analítico, transversal, de natureza quantitativa. Para coleta de dados, foram utilizados um questionário de caracterização inicial, o protocolo de Índice de Desvantagem para o Canto Moderno (IDCM) e o SRQ-20, adaptação do *Self Reporting Questionnaire*, todos eles disponibilizados de forma *on-line*. A amostra da pesquisa foi constituída por 46 participantes pertencentes aos corais amadores de duas instituições de ensino superior. **Resultados:** As médias do escore total do IDCM e SRQ-20 foram elevadas e estiveram correlacionadas positivamente entre si. Não houve diferença entre as pontuações do IDCM e SRQ-20 para os indivíduos que referiram a infecção por Covid-19, ou não. Indivíduos que afirmaram em suas respostas que sofreram influência da restrição social causada pela pandemia apresentaram escores mais altos do que aqueles que não fizeram essa afirmação. Não houve correlação com o tempo de canto e a desvantagem vocal e a presença de sintomas de transtornos mentais, mensuradas pelo IDCM e SRQ-20, respectivamente. Coralistas que mantiveram suas atividades de canto individual ou coletivamente apresentaram menores prejuízos vocais e emocionais. **Conclusão:** coralistas amadores relataram desvantagem vocal e transtornos mentais comuns possivelmente relacionados às restrições sociais provocadas pela pandemia de Covid-19. Os índices observados, todavia, parecem não estar associados à infecção pelo vírus em si, mas às limitações impostas pela restrição social do período pandêmico.

Palavras-chave: Voz; Canto; Covid-19; Autoavaliação; Transtornos mentais

Study carried out at Laboratório Integrado de Estudos da Voz – LIEV, Universidade Federal da Paraíba – UFPB – João Pessoa (PB), Brasil.
[1]Departamento de Fonoaudiologia, Universidade Federal da Paraíba – UFPB – João Pessoa (PB), Brasil.
[2]Escola de Ensino Superior do Agreste Paraibano – EESAP – Guarabira (PB), Brasil.
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Corresponding author: Yasmim Pereira de Andrade. E-mail: yasmimandrade193@gmail.com
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INTRODUCTION

The year of 2020 was marked by the beginning of the confrontation with the covid-19 pandemic, a disease caused by the new coronavirus (SARS-Cov-2) and highly contagious[1]. Restrictions measures, such as social distancing, have been adopted in many countries in the face of the need to contain the spread of the virus[2,3]. In this context, activities that previously worked in person, began to be avoided or assumed a virtual format. This new reality drastically changed the routine of a large part of the world's population, including individuals inserted in the field of art and culture, such as amateur choralists, thus affecting them in different ways[4].

The choirs are groups composed of diverse individuals who sing harmonically together, being able to be amateurs or professionals and, generally, they are formed in universities, schools, churches and associations, by public or private initiative[5]. The dynamics of choral formation involves the division of male voices into tenors and basses, and female voices into sopranos and contraltos, the so-called Suits[6]. The composition and age range of choralists are usually varied and heterogeneous, and in Brazil there are female, male and Mixed Choirs, children, youth, or formed by adults and the elderly[5,6].

The practice of choral singing is able to develop musical skills and competencies in amateur choralists[7,8]. In addition, it offers cognitive stimulation, produces the feeling of well-being during the performance of activities[9] and improves the mental health of this group[10]. It is worth mentioning that singing can develop in individuals who practice it greater respiratory support, resonance balance and intensity modulation[10,11], in addition to increasing vocal tessitura[12] and offer gains to the vocal performance and performance of these subjects[13,14].

With social distancing, many choirboys had their singing routines significantly modified, due to the ban on rehearsals and live and group performances. The virtual format was then adopted by some choirs to continue these activities, however, this configuration, which required the modification of the traditional format of the rehearsals, brought limitations in relation to the full interaction between the components of the group that maintained a more active contact with each other[15]. Research involving Swedish and Norwegian choral singers pointed to significant losses in the context of choral singing during the pandemic, especially in relation to the social aspect, which supports the bond that is established between choral participants[16].

As a result of the decrease in singing activities, it is assumed that the vocal performance of these choristers may also have been affected due to the reduction in vocal demand and consequent detraining of the musculature involved in vocal production[13]. As a significant part of the population[17], the singers experienced the Covid-19 pandemic not only as a moment that generated negative effects on their voice, but as a stressful situation, with negative effects also on their well-being[4]. This problem may be linked to the consequences of social distancing and isolation measures, since, despite contributing to the control of the coronavirus pandemic, they can generate compromises in the mental health of the population, expressed by mood instabilities, high levels of anxiety, stress, frustration, loneliness, anger and changes in sleep pattern[15].

Thus, it can be stated that, through the recent pandemic scenario, many negative impacts have fallen on corals, since social distancing has brought restrictions to the activities carried out by the groups and, with it, deprivations of benefits that corals can offer to the individuals who are part of them[15]. The present research aimed to investigate the association between measures of vocal disadvantage, symptoms of common mental disorders and the restriction of singing activities that occurred during the Covid-19 pandemic in amateur choristers and, based on this, to answer the following question: "is the restriction of singing activities that occurred during the Covid-19 pandemic related to measures of vocal disadvantage and symptoms of common mental disorders in amateur choristers?".

It is worth emphasizing the relevance of this research for the identification and understanding of possible impacts caused by a pandemic scenario in specific groups of voice professionals in the context of today's society. Reflecting on the impacts of the Covid-19 pandemic and its repercussions on individuals ' daily lives can help researchers and professionals to investigate and offer full and integral assistance to society in the post-pandemic context.

METHODS

This is a descriptive analytical cross-sectional study, of a quantitative nature, approved by the research ethics committee of the home institution, under Opinion number 5,254,269, in the year 2022. The sample was composed of choral participants from two higher education institutions, and the dissemination of the research was done through the digital media of the choristers and respective conductors. The collections were carried out in the year 2022 and, for this purpose, three instruments were used. online, through the platform Google Forms®, answered by all involved individuals only after signing the Informed Consent Form (ICF), made available on the same platform.

Initially, the choristers answered a questionnaire composed of the following items: full name; age; date of birth; city in which they reside; biological sex; gender; education; profession; diagnosis, or not, of mental disorder; diagnosis, or not, of dysphonia; context in which they used their voice; choir to which they had a link; regular singing time; singing practice during the pandemic; permanence, or not, of the functioning of the choir in which they participated; format of functioning of the choir in which they participated during the pandemic; benefits of choral singing; frequency of singing during the pandemic; vocal warming during the pandemic; vocal impacts that possibly affected the voice during the pandemic; infection or not by covid-19. In all, there were 21 mandatory items in order to characterize the profile of the amateur chorister regarding his singing practice during the pandemic and the possible vocal and emotional impacts resulting from the restrictions of this context.

The Moderna singing Handicap Index (MCDI) protocol was used to identify vocal handicap related to Moderna singing activity. The instrument consists of 30 items, organized into three subscales: disability, disadvantage and defect, which correspond, respectively, to the following domains: functional (example: "I feel difficulty in presentations because of changes in my vocal performance."); emotional (example: "my anxiety before performances is higher than usual."); organic (example " " I try to modify my voice to improve quality."). The answers are captured on a 4-point Likert scale, according to the frequency of occurrence: 0: Never; 1: Almost Never; 2: sometimes; 3: almost always and 4: Always. Each subscale can present a maximum value of 40 points and the total score is composed of the sum

of all subscales, with a maximum deviation of 120 points. The higher the score, the greater the disadvantage perceived by the individual[18].

To complete the data collection, participants responded to the Self Reporting Questionnaire (SRQ-20), consisting of 20 items for screening for common mental disorders. The answer to each question can be "yes" or "no". For each affirmative answer, a score of 1 is assigned, and the final score is the sum of these values. The scores obtained are related to the probability of the presence of non-psychotic disorder, ranging from 0 (no probability) to 20 (extreme probability), with 7 being the cut-off point indicative of common mental disorders[19].

The total number of participants of the choirs of the two higher educational institutions, for which the study was directed, was 95 people. Of these, 52 choristers answered the survey questionnaires, however, six were excluded because they stated, in the initial questionnaire, having a diagnosis of dysphonia or mental disorder. Thus, 46 individuals were selected to compose the final sample, composed of 47.8% of men (n=22) and 52.2% of women (n=24), with a mean age of 28 years (SD=10.6).

The statistical analysis was carried out in order to investigate the correlation between the indices of the instruments investigated and compare the average scores of these instruments among the choristers in relation to the characteristics of vocal behavior and the modifications of the participant's activities, as well as those of the choir in the pandemic period. For the quantitative variables, parametric tests were used from the verification of the normal probability distribution of the variables, using the Kolmogorov-Smirnov test. Thus, Pearson's correlation tests and T-test for independent samples, performed in the software SPSS, version 20.0.0, were selected for the analysis. The level of statistical significance adopted was 0.05 for all analyses.

RESULTS

Most participants (54.3%) answered that they did not use the singing voice in contexts other than choir. The other 45.7% stated that they made use of the singing voice outside the choir, mentioning that the greatest use occurred in the context of individual amateur singing (57.1%), followed by band (23.8%) and, to a lesser extent, in individual professional singing (19.1%). It was also noted that the frequency of the singing rhythm decreased during the pandemic (80.4%) and that, according to the majority of choristers (87%), the restrictions caused changes in their vocal performance, with vocal conditioning being the most prevalent impairment (60.9%). Regarding the benefits offered by choral singing, participants reported social interaction (93.5%) as the most significant, followed by cultural knowledge (91.3%) (Table 1).

The mean total MCDI score was 27.96 (SD= 22.72) points. The "defect" dimension, which is related to the organic domain, had a higher mean score 12.5 (SD= 9.62); the "disability" dimension, related to the functional domain, in second place 10.6 (SD= 7.8) and the "disadvantage" dimension, which reflects the emotional domain, in lower result 5.3 (SD= 6.8). The overall SRQ-20 score averaged 6.57 (SD= 4.74), demonstrating a value close to the cut-off point of the instrument for screening for common mental disorders, which is 7 Points (Table 2).

The SRQ-20 score showed a positive correlation with all dimensions of the IDCM. This implies a tendency of similar behavior regarding the score of the two instruments, that is, both presented higher or lower scores directly proportional. However, it was observed that the vocal and emotional aspects did not correlate with the singing time of the participants (Table 3).

Regarding covid-19 infection, 41.3% (n=19) of the participants stated that they had been infected by the virus, while 58.7% (n=27) did not report covid-19 infection. Given the above, it was noted that there were no significant differences between the scores of the IDCM and SRQ-20 instruments when comparing individuals who had and did not have Covid-19.

However, when comparing the means of the two instruments in relation to the influence of social restriction on vocal and emotional

Table 1. Descriptive analysis of the use of the sung voice in different contexts. characteristics of singing practice during the Covid-19 pandemic and benefits of choral singing from the perspective of choristers

Question	Answer	n (%)
Do you use your voice in other contexts?*	No	25 (54.3)
	Amateur singles	12 (57.1)
	Band	5 (23.8)
	Individual professional	4 (19.1)
What are the benefits of choral singing?*	Social interaction	43 (93.5)
	Cultural knowledge	42 (91.3)
	Emotional benefit	41 (89.1)
	Vocal improvement	41 (89.1)
	Musical knowledge	39 (84.8)
How was the singing frequency during the Covid-19 pandemic?	Slowed down the rhythm of singing	37 (80.4)
	Increased the singing rhythm	5 (10.9)
	Continued at the same pace as before the pandemic	4 (8.7)
Do you feel that the restrictions caused by the pandemic have affected your vocal performance?*	No	6 (13.0)
	Yes. regarding the loss of vocal conditioning	28 (60.9)
	Yes. regarding the difficulty in breathing during singing	27 (58.7)
	Yes. regarding the difficulty to sustain the notes	21 (45.7)
	Yes. regarding the loss of vocal extension	20 (43.5)
Total		46 (100.0)

*The question allowed the participant to offer more than one type of answer. so the sum of the answers does not total 100.0%
Subtitle: n = absolute number of participants; % = percentage

Table 2. Descriptive analysis of the handicap index scores for the total and by dimensions Moderna corner and the Self Reporting Questionnaire two participants

Instrument		Average	SD
MSHI	Disability	10.6	7.8
	Disadvantage	5.3	6.8
	Defect	12.5	9.6
	Total	27.9	22.7
SRQ-20	Total	6.6	4.7

Subtitle: MSHI = Modern Singing Handicap Index; SRQ-20 = Self Reporting Questionnaire; SD = standard deviation

Table 3. Analysis of the correlation between the scores of Self Reporting Questionnaire and Vocal disadvantage Index (total and by dimensions) and between singing time. Vocal disadvantage Index and Self Reporting Questionnaire the amateur choristers

Correlations		MSHI				SRQ-20 Total
		Disability	Disadvantage	Defect	Total	
SRQ-20	Correlation coefficient	0.313	0.292	0.460	0.389	-
	p-value	0.034*	0.049*	0.001*	0.008*	-
Singing time	Correlation coefficient	0.154	0.113	0.062	0.116	- 0.046
	p-value	0.307	0.455	0.682	0.442	0.764

Pearson's correlation test. *Significant at 0.05
Subtitle: MSHI = Modern Singing Handicap Index; SRQ-20 = Self-Report Questionnaire

Table 4. Comparison of the mean scores of the Self-Report Questionnaire and Disadvantage Index for Modern Canto (total and by Dimensions) in relation to the impact of Covid - 19 during the pandemic. the impacts of social restriction caused by the pandemic and the maintenance of singing activities during the pandemic

Question	Answer	Instruments (mean and SD)				
		MSHI				SRQ-20 Total
		Total	Disability	Disadvantage	Defect	
Have you been infected by Covid-19?	Yes	29.2 (19.4)	10.4 (7.1)	5.1 (4.9)	13.7 (8.9)	7.5 (4.4)
	No	27.1 (25.1)	10.0 (8.3)	5.4 (7.9)	11.7 (10.2)	5.9 (4.9)
	p-value	0.76	0.08	0.86	0.48	0.27
Do you think that the current vocal and emotional condition has been impacted by the social restriction caused by the pandemic?	Yes	31.4 (23.0)	11.3 (7.9)	6.1 (7.3)	14.0 (9.3)	7.5 (4.6)
	No	17.0 (18.6)1	6.6 (6.5)	2.7 (4.4)	7.6 (9.2)	3.6 (4.0)
	p-value	0.048*	0.066	0.071	0.062	0.015*
Did you maintain singing activities during the pandemic?	Yes. individual	19.5 (15.6)	6.8 (4.7)	3.0 (4.2)	9.8 (8.3)	6.0 (4.9)
	Yes. collective	20.1 (9.2)	7.6 (2.9)	3.1 (1.9)	9.4 (5.5)	7.9 (4.3)
	Yes. individual and collective	33.2 (32.1)	12.4 (10.9)	7.6 (11.1)	13.2 (11.4)	5.0 (4.4)
	No	39.6 (20.9)	14.3 (7.4)	7.6 (4.6)	17.7 (10.2)	8.3 (4.8)
	p-value	0.083	0.04*	0.166	0.148	0.33
Did you perform vocal warm-up techniques during the pandemic?	Yes	7.9 (5.8)	2.8 (2.7)	8.6 (8.1)	19.3 (15.5)	4.7 (3.5)
	No	11.6 (8.6)	6.9 (8.2)	15.0 (9.8)	33.5 (25.0)	7.6 (5.1)
p-value		0.094	0.042*	0.019*	0.022*	0.021*

Mean comparison t-test for independent samples. *Significant at 0.05
Subtitle: MSHI = Modern Singing Handicap Index; SRQ-20 = Self-Report Questionnaire; SD = standard deviation

condition, the scores were significantly higher for those who stated that they were influenced by the social restriction caused by the pandemic, compared to those who did not make this statement.

When comparing the scores of the IDCM and SRQ - 20 among choristers who did not maintain their singing activities (39,6%) and those who maintained them individually or collectively, there was a difference between the groups in the "disability" dimension of the IDCM. The test post-hoc (Tukey's test) pointed out that the difference was significant between individuals who maintained the activities individually and those who did not, with greater damage to the second group. Finally, participants who performed vocal warm-up practices had a score of total MCDI, dimensions "disadvantage" and "defect" and SRQ-20 significantly lower than those who did not perform (Table 4).

DISCUSSION

The Covid-19 pandemic has significantly interfered in various social and professional contexts around the world. In this sense, the practice of choral singing was also affected, since the social restriction imposed by the pandemic brought limitations on the performance of group activities, which had to be suspended or adapted to the online format. This led this study to hypothesize that the social restriction resulting from the pandemic period could be related to vocal and emotional impairments in the lives of amateur choristers.

In this research, it was observed that amateur choralists perceived several benefits offered by the practice of choral singing, such as: emotional, social interaction, vocal improvement, musical and cultural knowledge. These results are in addition to the results of different studies that prove the positive effects provided by collective singing[10,11], which, however, have been hampered amid social distancing, since the virtual model adopted by some choirs during the pandemic has not been able to provide the shared experience of singing together satisfactorily[15].

The sample that composed this research was diverse, being formed by individuals who sang not only in the choir, but in bands, amateur and professional individual singing, which evidences the diversity of subjects that make up a choir, whether of different genders, ages, professions and conditions[7-9]. This finding reflects the vast and grandiose experience that choral singing provides from the point of view of the insertion of different audiences that are part of society.

Most of the research participants agreed with the fact that singing frequency decreased during the pandemic, an

aspect that may have affected the vocal performance of these choristers and caused losses in vocal conditioning and breathing difficulties during singing[13]. Such results may be a reflection of the limitations faced by this group, as pointed out by another study done with choristers through the pandemic scenario, demonstrating that the aspects that they missed the most were active vocal training and respiratory training, exercised more frequently before the pandemic[1].

Regarding the total MCDI score, it is noteworthy that there is no validated cut-off point for this instrument, which makes it difficult to interpret the presented result. However, considering that the MCDI is an adaptation of the Vocal disadvantage Index (VHI) for the sung voice, and that it has a similar structure to the original instrument in terms of score and dimensions, it is possible to make a correspondence with the latter. The clinical IDV cut-off value is 19 points[20], threshold score for classification of people without voice problems. In this research, an average score of approximately 28 points was observed for the MCDI, which can be considered an important vocal disadvantage, mainly because it refers to an audience with specific vocal requirements (singers).

Of the dimensions evaluated in this instrument, the score of the "defect" dimension obtained the highest result, indicating possible permanent or temporary anatomical, structural, psychological, physiological loss or abnormality in the individuals evaluated[18], a result that adds to those in the literature that already points out that vocal difficulties are related to the restrictive period resulting from the new coronavirus pandemic[4]. This fact may be associated with the decrease in singing rhythm and vocal performance experienced by most participants[13], since important components of the vocal aspects, such as performing vocal warm-ups and group presentations, were impaired during this period, and this practice is essential for the vocal quality and capacity of the choristers[14].

With regard to screening for common mental disorders, the total mean SRQ20 did not reach the cut-off point of the instrument[19], but was very close to it, which points to a risk situation for mental disorders in this population. This problem can be explained by the effects of social distancing and isolation measures that, despite having contributed to the control of the coronavirus pandemic, were responsible for bringing compromises to the mental health of the population[17,21]. In this perspective, the literature already points out that, since the practice of choral singing seems to have a significant effect on the quality of life related to mental health of individuals participating in the group[10], as a result of the limitations imposed by social restriction, the singers experience the current scenario as a stressful time and with negative effects on their well-being[15]. It is worth noting that singers are already more prone to stress and anxiety in general[22], which further covers the presented problem.

Psychological stress is intrinsic to vocal performance and can even be used in a positive way. However, for artists who cannot live with this anxiety and stress and who even have their performance negatively affected by this discomfort, specialized treatment is recommended. Stress can lead to physical consequences such as dry mouth, vocal fatigue, palpitations, heartburn, and others. In more severe cases, it is associated with increased muscle tension, especially in the head and neck, and with constant headaches[6]. The practice of choral singing seems to have a significant effect on the quality of life related to mental health, anxiety and depression and can be a useful exercise to improve and maintain the mental health of choirboys[10]. Thus, it is possible to see that the return of non-restrictive activities of the choir may again offer various gains to the individuals who are part of it.

The SRQ-20 score was positively correlated with all dimensions of the IDCM. Thus, the choristers who presented high vocal disadvantage also presented high scores in the SRQ-20. This demonstrates that, for the sample studied, the magnitude of the vocal handicap was directly related to the magnitude of the symptoms of mental disorder. It should be noted that, for some years, the literature has been pointing out the direct relationship between emotional aspects and the voice. Emotional alterations are capable of causing vocal modifications, and several vocal deviations can be associated with negative psychological aspects, such as anxiety, for example[23,24].

Therefore, it is necessary to maintain a balance during presentations, since anxiety can interfere with the individual's form of expression and communication, whether in relation to the body, speech and / or voice[25]. That said, it is of paramount importance that the singer is prepared vocally and emotionally to have the ability to transmit the musical and poetic text with rigor and clarity, bringing to the public the integral version that he intends to present.

Another important result to be discussed is that, although contamination by Covid - 19 may have caused vocal and emotional problems that have already been observed[26,27], the comparison of the means of the IDCM and SRQ-20 scores among the participants who stated that they had been infected, or not, by Covid-19, pointed out that there was no difference between the groups. This indicates that the aspects related to vocal handicap and common mental disorders observed in the sample of this study were possibly not associated with the presence of the disease itself, but with the social consequences generated by isolation. This is a social adversity that needs to be taken into account in the post-pandemic period, since the practice of choral singing seems to exert an important influence on the vocal and mental health of these individuals. The etiology of vocal and emotional damage observed in such an interconnected way in this research should be discussed in a broader perspective, considering the interaction of aspects never experienced before, which can generate important developments for the next panoramas in the field of clinical and vocal science.

Individuals who stated in their responses to the IDCM and SRQ-20 that they were influenced by the social restriction caused by the pandemic had significantly higher total scores than individuals who did not make this statement. As in the present research, a study that evaluated the possible relationship between vocal changes and behaviors, stress and anxiety in users of the artistic voice also pointed out that those who experienced more vocal difficulties were more anxious and worried about their voice and significantly stressed by the situation imposed by the pandemic[4], which demonstrates, in fact, that social restriction can be closely linked to vocal disadvantage and to negative psychological effects also in the perception of the participants themselves.

Recent studies have already pointed out that artistic voice professionals who experienced greater difficulties during the pandemic period were concerned about their voice and considerably more stressed by the situation imposed by it, which demonstrates that even individuals with greater vocal preparation obtained losses, including financial, through the context of social restriction during the Covid-19 pandemic. This result proves the challenges faced in this environment,

not only in amateur singing groups, but also among those who use the sung voice as a work tool.

A study conducted with Swedish and Norwegian choirboys points out that different losses of the experience of choral singing during the Covid-19 pandemic are related to the number of years that the Choirboys participate in the group[16]. However, according to the present research, there was no correlation between singing time and vocal disadvantage and mental disorders in choristers. This finding demonstrates that social restriction had a significant impact on different individuals that are part of the corals, regardless of the time of experience in the activity. This data needs to be seen as a broad result of losses for all singers who were exposed to different external factors, such as their own difficulties in front of the format online negative emotional aspects resulting from social restriction.

The choristers who maintained their singing activities individually or collectively had significantly lower scores in the "incapacity" dimension of the IDCM than those who did not maintain them, which reveals a greater ability to perform activities normally expected for those who continued singing. This reality highlights the importance of singing practice for the development of musical skills and competencies in singers[11,12,14] and points out the difficulties faced by a considerable part of amateur choralists when continuing this practice in the face of the limitations that the virtual choir model brought[15].

Vocal warm-up is a direct approach program that aims to provide change in vocal functioning, offering instructions on techniques for the voice, in order to encourage more efficient vocal production and better prepare the voice for specific demands[28]. Different studies point out that vocal warming can bring several benefits, being fundamental for individuals who use their voice more frequently and intensely in their daily activities[13,29].

This reality may explain the results of this research, which indicate that individuals who maintained vocal warm-up practices had a total MCDI score, dimensions "disadvantage" and "defect" and SRQ-20 significantly lower than those who did not maintain them, reinforcing the idea of the benefits that vocal warm-up can offer not only for professional singers, but also for amateurs. According to the literature, a considerable part of amateur singers believe that vocal training is less important compared to professionals[16], which may also justify higher rates of disadvantage and mental disorders for those who did not maintain such practices.

In this context, analyzing the relationship between changes during social restriction, vocal behaviors, stress and anxiety in users of the artistic voice is an important agenda in the current and post-pandemic scenario, since little is known about how the effects resulting from current circumstances have had repercussions among singers, especially with regard to amateur choristers.

One of the limitations to be highlighted in this study refers to the lower response rate than expected by the participants of the selected choirs. Not all choristers responded to the survey questionnaires, decreasing the number of the final sample and limiting a broader analysis.

In addition, another aspect that deserves to be noted is the fact that the results of this study depended on the participants ' perception of possible vocal and emotional impairments in the face of the pandemic scenario, which points to the presence of a possible memory bias, since individuals should evaluate current conditions on self-perception of vocal disadvantage and common mental disorders and assess whether this current condition was distinguished from the condition experienced before the pandemic period. In this context, it was not possible to establish a causal relationship between social restriction and vocal and emotional aspects, since, for this, a longitudinal study would be necessary, with comparisons of data before and during/after the restrictive period imposed by the Covid-19 pandemic.

Finally, it is also noteworthy that the results presented high internal validity and that the information obtained was reliable for the studied population, due to the care applied in the planning and methodological execution of the research. However, due caution is recommended for inferences of these results for other population groups, due to the particular social and cultural characteristics of the group studied.

CONCLUSION

Amateur choristers may experience vocal and emotional impairments related to the strict restriction of social activities imposed by the Covid-19 pandemic. Vocal handicap related to singing, measured by the IDCM, and symptoms of common mental disorders, measured by the SRQ-20, are significantly correlated in the sample studied. However, the Covid-19 infection was not associated with these losses. Vocal disadvantage in singing was higher in individuals who did not maintain their singing activities during the pandemic period, and individuals who stated that their vocal and emotional conditions were influenced by the pandemic, had significantly higher rates of vocal disadvantage and common mental disorders. The results indicate that the vocal and emotional impairments presented are not necessarily associated with the virus infection itself, but possibly with the resulting social restriction.

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