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Original Article

Perceived Voice Changes among Speech Pathologists during COVID-19 Pandemic

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Abstract

Background: The inadequate and stressful environment of COVID-19 pandemic affected and triggered the inappropriate vocal behavior with stressful tension of laryngeal muscles and scapular griddle region among many practicing speech pathologists.
Objective: To determine voice changes among speech pathologists during COVID-19 pandemic.
Study type, settings & duration: A cross sectional study was conducted among certified speech pathologist with specific specialties and experiences across country of Pakistan and abroad through an online valid and reliable self-assessment tool from May to October 2020.
Methodology: Almost 150 Speech pathologists were approached through online medium, out of which only 70 Speech Pathologists responded on the research questionnaire. Formal ethical approval was taken from Riphah International University research ethical committee. After taking consent, the questionnaire link was shared with practicing speech pathologists. Data was collected and analyzed using SPSS version 16.
Results: A total of 70 certified speech pathologists participated in the study, among them 7 (10%) were male and 63 (90%) were female. The preferred method of service delivery observed among speech pathologists was 34 (49.5%) hybrid service having both onsite and tele service. It was observed that 6 (8.6%) and 12 (17.1%) speech pathologists were facing with severe and moderate symptoms of vocal fatigue index, and 4 (5.7%),10 (14.3%) speech pathologists were with symptoms of severe and moderate voice use problems (pain in neck, throat etc.) respectively. It was also observed that with rest 58 (82.8%) speech pathologists were feeling extremely and moderately relieved from pain.
Conclusion: The stressful and unusual environment during the first phase of COVID 19 pandemic, affected speech pathologists in presenting vocal fatigue symptoms and voice use problems like feeling of pain in laryngeal area etc. Higher proportion of speech pathologists presented vocal fatigue symptoms and other voice induced problems.
Key words: Speech pathologists, voice, vocal fatigue, pandemic.

Introduction

At the end of December 2019, an epidemic of coronavirus strain 2 emerged in Wuhan city of China[1] with symptoms of severe respiratory syndrome, which later declared pandemic and public health emergency was imposed across the globe by World Health Organization (WHO).[2]

An Infodemic situation emerged during the first phase of pandemic of COVID-19. The burden of information, instructions regarding COVID 19, along with the locked environment created anxiety and stress among health professionals, public and academicians.[3] The professional duties of speech pathologists i.e. direct handling and interaction with clients during the speech session, was greatly affected due to prevailing pandemic problems. The most affected group of professionals in terms of physical and mental health was seen to be health care professionals working in different health care facilities.[4]

The first infection was reported on February 26, 2020 in Karachi Pakistan. With the passage of time all other cities of Pakistan also reported the incidences of COVID-19 virus. All major cities of

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Authors Contribution

RZ conceptualized the project and did the literature search. SZ performed the statistical analysis. RZ & SZ did the data collection and drafting, revision & writing of manuscript.

Pakistan started to report increased rate of COVID-19 cases.[5]

The prevailing panic and agronomic conditions due to COVID-19 was a key factor of voice changes and vocal use during this uncertain condition without prior vocal training can be performed through incorrect muscle adjustment. This unusual adjustment, produced with excessive tensions and pull of laryngeal musculature and scapular girdle region, can further create an inappropriate vocal behavior.[6] This inappropriateness in vocal behavior create vocal fatigue symptoms and musculoskeletal pain in thoracic and laryngeal region.

It is necessary to understand the vocal changes and related unusual adjustment of sound, specialty of speech pathologists, because the professional responsibilities of speech pathologist rely on the proper sound production, vocal adjustment and free of any musculature pain. These factors may create disturbance in the professional presentations and executions of responsibilities with client. The voice changes of speech pathologists ultimately affect the professional duties of therapists and affected the clients in other way.[7]

COVID-19 is massive global health crisis. This study was designed to investigate the perceive voice changes of speech pathologist during COVID-19 pandemic due to online teaching and tele practice. The aim of the study was to assess the impact of agronomic condition on the vocal changes of speech therapists and their performance. The study provided a baseline empirical information regarding vocal hygiene and vocal practices during pandemic.

Methodology

This was six months cross sectional study conducted among certified speech pathologist with specific specialties and experiences across Pakistan and abroad through an online medium valid and reliable items of self-reported tool Vocal fatigue index[8] and Voice handicap index[9] from the duration of May to October 2020. Almost 150 Speech pathologists were approached through online medium, out of which only 70 Speech Pathologists responded on the research questionnaire. Participants were selected on the basis of providing online services i.e. tele practice or were engaged in online teaching convenient sampling technique was incorporated to approach the participants of the study. No physical or psychological harm was implemented to the research participants. Informed consent was shared with the participants including statement indicating the purpose and procedures of the study. The purpose of research study was described to each participant prior in email/social media with attached consent form to the questionnaire. After the participant agreed to the consent form the questionnaire link was made available through online medium to speech pathologists. The questionnaire consisted four sections including demographics, vocal fatigue index and voice handicap index having items of voice use problems and changes of voice with rest. The questionnaire consisted a total of 27 research items with distribution of 7, 12, 5 and 3 questions for demographic section, vocal fatigue index, voice handicap index having items of voice use problem and change in voice with rest respectively**.** Each question of vocal fatigue index and voice handicap index was rated with symptoms severity with scoring 0 for no symptoms, 1 for some time, 2 mild, 3 moderate and 4 for severe symptoms. Similarly, the severity rating for voice change with rest was 0 for no change, 1 for some time good, 2 mild, 3 moderate and 4 for extremely good. For scoring, simply added the score of each questions of each category of voice change. The rating presentation of each category of voice change was interpreted according to the Figure-1. Both tools incorporated were standardized that can identify voice problems with good reported validity, reliability, sensitivity and specificity.[8,9] Data was collected and analyzed using SPSS version 16.

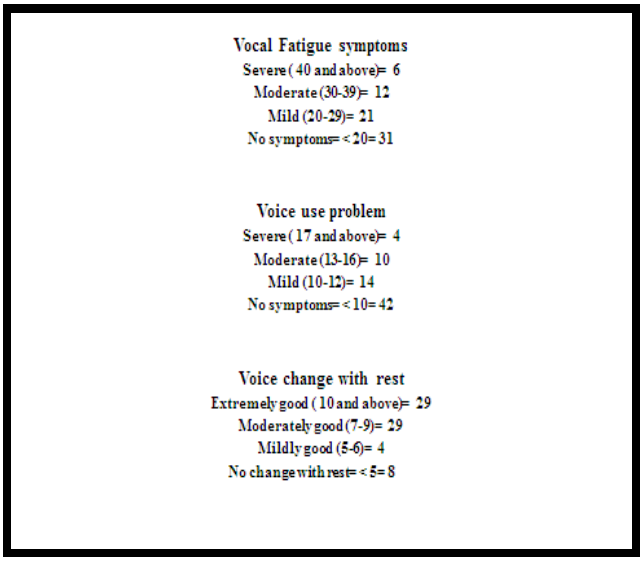

Figure 1: Symptoms severity scale.

The Ethical approval was obtained from Research Ethical Committee of Riphah International University, Islamabad.

Results

A total 70 certified speech pathologists participated in the study, Frequency distribution analysis showed that among them 7(10%) were male and 63 (90%) were female. Majority of speech pathologists 43 (68.3%) were with primary specialty on fluency, language, cognition, voice etc. (Table-1). Speech pathologists of Punjab province of Pakistan and city Islamabad participated in majority with frequency 28 (40%) and 30 (42.8%) respectively (Figure-2). The female speech pathologists were dealing infants and pediatrics with greater frequency than male speech pathologist. A significant difference p =0.035 was observed between male and female speech pathologist for target population, with higher frequency of child patients of female pathologists (Table-2). Among all, 34 (49.5%) speech pathologists mentioned hybrid services i.e. amalgam of both onsite and tele service as preferred method of service delivery in health care profession during the pandemic (Table-3). It was observed that 6 (8.6%) and 12 (17.1%) speech pathologists were facing with severe and moderate symptoms of vocal fatigue index, and 4 (5.7%),10 (14.3%) speech pathologists were with severe and moderate level of voice use problems (pain in neck, throat etc.) respectively. It was also observed that with rest 58 (82.8%) pathologists were feeling extremely and moderately good from pain (Table-4). The study provided that there was no significant difference between each parameters of vocal fatigue index p =0.213, voice use problems p =0,187 and voice change with rest p =0.078 (Table 5-7), shows the response patterns of speech pathologists to vocal fatigue parameters, feeling of pain in laryngeal areas due to voice use and voice changes after rest period respectively.

Discussion

The study included a total of 70 speech pathologists, and female speech pathologists were with higher frequency in present study compared to male which shows greater preference of female to opt this profession. Other study also endorsed the greater preference of female in selecting the field of speech pathology.[10] The study participated pathologists were mainly from Islamabad and Punjab because the authors personal links and belonging was also from the same area and author used convenient sampling techniques for the study. The speech pathologists participated in this study was using hybrid method such as face to face and tele-rehabilitation services both for speech therapy with greater frequency than individual mode of service delivery. Other studies also showed similar pattern of service delivery mode of speech pathologists.[11,12] A study conducted by Baran

Table 1: Age and gender wise distribution of speech therapists participated in the studywith respect to primary specialty.

			Primary Specialty				
Gender			*Language, Cognition*	*Feeding and Swallowing*	*Fluency, Language, Cognition, Voice etc*	*Speech production, Language, Rehabilitation etc*	*Total*
Male	Age	21-34 Year	1	1	2	1	5
			20.0%	20.0%	40.0%	20.0%	100.0%
		35-44 Year	0	0	1	0	1
			.0%	.0%	100.0%	.0%	100.0%
		55-64 Year	0	0	0	1	1
			.0%	.0%	.0%	100.0%	100.0%
	Total		1	1	3	2	7
			14.3%	14.3%	42.9%	28.6%	100.0%
Female	Age	21-34 Year	1	1	30	12	44
			2.3%	2.3%	68.2%	27.3%	100.0%
		35-44 Year	2	0	6	1	9
			22.2%	.0%	66.7%	11.1%	100.0%
		45-54 Year	2	0	3	1	6
			33.3%	.0%	50.0%	16.7%	100.0%
		55-64 Year	0	0	4	0	4
			.0%	.0%	100.0%	.0%	100.0%
	Total		5	1	43	14	63
			7.9%	1.6%	68.3%	22.2%	100.0%

Table 2: Target population of speech therapists with respect to average number of patients treated per week.

Gender			Average Patients Per Week				Total
			10 or Less	11-30	31-50	>50	
Male	Target Population	Infant, Pediatric	0	0	0	1	1
			.0%	.0%	.0%	100.0%	100.0%
		Pediatric, Infant, Adolescence	0	1	0	0	1
			.0%	100.0%	.0%	.0%	100.0%
		Pediatric, infant, adult, Adolescence	0	1	0	1	2
			.0%	50.0%	.0%	50.0%	100.0%
		Adult and Adolescence	2	1	0	0	3
			66.7%	33.3%	.0%	.0%	100.0%
	Total		2	3	0	2	7
			28.6%	42.9%	.0%	28.6%	100.0%
Female	Target Population	Infant, Pediatric	15	6	1	0	22
			68.2%	27.3%	4.5%	.0%	100.0%
		Pediatric, Infant, Adolescence	3	5	0	1	9
			33.3%	55.6%	.0%	11.1%	100.0%
		Pediatric, infant, adult, Adolescence	14	8	3	0	25
			56.0%	32.0%	12.0%	.0%	100.0%
		Adolescence	2	1	0	0	3
			66.7%	33.3%	.0%	.0%	100.0%
		Adult and Adolescence	4	0	0	0	4
			100.0%	.0%	.0%	.0%	100.0%
		Total	38	20	4	1	63
			60.3%	31.7%	6.3%	1.6%	100.0%

Table 3: Frequency distribution of mode of service delivery of speech therapists with respect to target population.

Mode of Service Delivery	Target Population					Total
	Infant, Pediatric	Pediatric, Infant, Adolescence	Pediatric, Infant, Adult, Adolescence	Adolescence	Adult and Adolescence	
Live, face to face	10	4	11	3	3	31
	32.3%	12.9%	35.5%	9.7%	9.7%	100.0%
Tele communication practice	1	2	1	0	1	5
	20.0%	40.0%	20.0%	.0%	20.0%	100.0%
Hybrid services (Both live and tele services)	12	4	15	0	3	34
	35.3%	11.8%	44.1%	.0%	8.8%	100.0%
Total	23	10	27	3	7	70
	32.9%	14.3%	38.6%	4.3%	10.0%	100.0%

Table 4: Frequency of different voice change parameters among speech pathologist n (%).

Voice Change Variables	Severe	Moderate	Mild	No Symptoms	Extremely Good	Moderately Good	Mildly Good	No Change	Total
Vocal fatigue symptoms	6 (8.6)	12 (17.1)	21 (30)	31 (44.3)	NA	NA	NA	NA	70 (100)
Voice use problem (Feeling of Pain)	4(5.7)	10 (14.3)	14 (20)	42 (60)	NA	NA	NA	NA	70 (100)
Voice change with rest	NA	NA	NA	NA	29 (41.4)	29 (41.4)	4 (5.7)	8 (11.4)	70 (100)

Table 5: Response pattern of speech therapists to vocal fatigue index parameters n(%).

Vocal fatigue index variable	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	*Always*	*p value*
I don't feel like talking after a period of voice use	10 (14.3)	14 (20)	28 (40)	9 (12.9)	9 (12.9)	0.213
My voice feels tired when I talk more	4 (5.7)	14 (20)	17 (24.3)	22 (31.4)	13 (18.6)	
I experience increased sense of effort with talking	15 (21.4)	15 (21.4)	16 (22.9)	13 (18.6)	11 (15.7)	
My voice gets hoarse with voice use	13 (18.6)	18 (25.7)	20 (28.6)	11 (15.7)	8 (11.4)	
It feels like work to use my voice	13 (18.6)	20 (28.6)	19 (27.1)	11 (15.7)	7 (10)	
I tend to generally limit my talking after a period of voice use	12 (17.1)	13 (18.6)	16 (22.9)	21 (30)	8 (11.4)	
I avoid social situations when I know I have to talk more	22 (31.4)	17 (24.3)	13 (18.6)	13 (18.6)	5 (7.1)	
I feel I cannot talk to my family after a work day	22 (31.4)	8 (11.4)	20 (28.6)	12 (17.1)	8 (11.4)	
It is effortful to produce my voice after a period of voice use	13 (18.6)	16 (22.9)	14 (20)	23 (32.9)	4 (5.7)	
I find it difficult to project my voice with voice use	18 (25.7)	15 (21.4)	21 (30)	12 (17.1)	4 (5.7)	
My voice feels weak after a period of voice use	9 (12.9)	15 (21.4)	25 (35.7)	15 (21.4)	6 (8.6)	
My voice feels weak after a period of voice use	12 (17.1)	12 (17.1)	25 (35.7)	16 (22.9)	5 (7.1)	

Table 6: Response pattern of speech therapists to voice use problems (feeling of pain) n(%).

Voice use problem	*Never*	*Almost Never*	*Sometimes*	*Almost Always*	*Always*	*p value*
I experience pain in the neckat the end of the day with voice use	19 (27.1)	13 (18.6)	24 (34.3)	6 (8.6)	8 (11.4)	0.187
I experience throat pain at the end of the day with voice use	16 (22.9)	15 (21.4)	24 (34.3)	11 (15.7)	4 (5.7)	
My voice feels sore when I talk more	13 (18.6)	17 (24.3)	23 (32.9)	11 (15.7)	6 (8.6)	
My throat aches with voice use	12 (17.1)	22 (31.4)	18 (25.7)	14 (20)	4 (5.7)	
I experience discomfort in my neck with voice use	19 (27.1)	17 (24.3)	20 (28.6)	9 (12.9)	5 (7.1)	

Table 7: Response pattern of speech therapists to voice change with rest n(%).

Voice change with rest	*Never*	*Almost never*	*Sometimes*	*Almost always*	*Always*	*p value*
My voice feels better after I have rested	2 (2.9)	6 (8.6)	7 (10)	19 (27.1)	36 (51.4)	0.078
The effort to produce my voice decreases with rest	6 (8.6)	6 (8.6)	12 (17.1)	24 (34.3)	22 (31.4)	
The hoarseness of my voice gets better with rest	2 (2.9)	6 (8.6)	7 (10)	27 (38.6)	28 (40)	

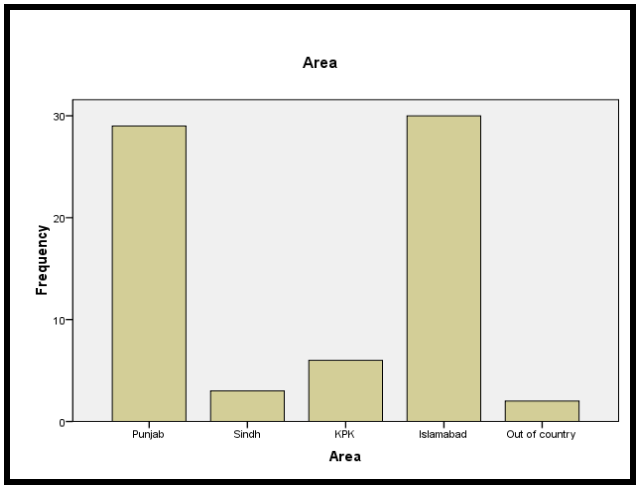

Figure 2: Area wise distribution of speech therapists participated in the study.

Bayati et al provided that due to shortage of speech pathologists, the use of tele rehabilitation service are predominant.[13]

It was found that 39 (55.7%) out of total 70 speech pathologists were with mild to severe vocal fatigue symptoms during the pandemic and 28(40%) were with mild to severe pain in speech producing and surrounding organs. It has been observed that trauma, stress and pressure work affect the vocal activity of sound production.[14] Present findings of vocal fatigue symptoms assessed in the study was concurrent with other study conducted among teachers in India.[15] It is also estimated that stress due to sudden shift to online synchronous mode of teaching have been directly associated with increased level of vocal symptoms among university professors of Israel.[16] Where as in present study mild to severe vocal fatigue symptoms have also

been reported. During pandemic, worsening voice conditions such as dry throat, effort in addressing and hoarseness after period of voice use were reported frequently in Brazilian teachers who were engaged in online teaching during pandemic Covid-19 and they seek guidance of vocal hygiene from speech pathologists.[17] In present study, speech pathologists experienced mild to severe pain in laryngeal areas after period of voice use engaged in tele practice.

No significant difference was found in the response patterns of each parameters of three different category of voice change index tool of this study. It shows internal consistency and reliability of research tool, against the present population. It is believed that greater the internal consistency of research tool, greater will be the reliability of the results provided by the instrument.[18, 19]

The results showed that 34(49.5%) speech pathologists preferred hybrid mode of services over only tele practice. Majority of practitioners from other countries also reported tele practice less effective than onsite services due to sudden shift to technology and non-availability of prior training for delivering tele practice.[20]

The major limitation of the study was low sample size. Due to many factors associated with COVID-19 such as locked environment, physical distancing, infodemic and overburden information stuffs the pattern of online response was very limited. Still the finding of this study is quiet interesting and provided baseline information regarding the voice related issues of speech pathologists in stressful conditions.

The stressful and unusual environment of COVID-19 pandemic affect speech therapists in presenting vocal fatigue symptoms, feeling of pain and other problems in sound producing organs. Higher proportion of speech pathologists presented focal fatigue symptoms and other voice used problems in this study. COVID-19 pandemic, kind stressful and unusual environments thus have a key impact on speech therapists and can directly suffer the services of speech therapy offered to the client.

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Conflict of interest: None declared.

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