Self-reported voice problems and coping strategies in Western Classical and Carnatic singers:

A mixed-methods study

Volume 2

by

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Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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December 2023

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Appendix 2.1- Search strategy for systematic review on self-reported voice problems in classical singers for each database

MEDLINE COMPLETE

1. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
2. (MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Dysphonia") OR (MH "Aphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngeal Edema") OR (MH "Laryngitis") OR (MH "Granuloma, Laryngeal")
3. (voice OR vocal)N5(problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue OR nodule OR polyp or h#emorrhage) OR aphoni* OR dysphoni* OR "muscle tension dysphonia" OR phonotrauma OR (laryn*)N3(pain OR injury)
4. 2 OR 3
5. 1 AND 4

ACADEMIC SEARCH COMPLETE

1. DE "SINGERS" OR DE "BARITONES (Singers)" OR DE "BASS-baritones" OR DE "BASSES (Singers)" OR DE "BLACK singers" OR DE "CHOIRBOYS" OR DE "FOLK singers" OR DE "GOSPEL singers" OR DE "JAZZ singers" OR DE "JEWISH singers" OR DE "MALE singers" OR DE "MEZZO-sopranos" OR DE "OLDER singers" OR DE "OPERA singers" OR DE "RUNE singers" OR DE "SOPRANOS (Singers)" OR DE "TENORS (Singers)" OR DE "WOMEN singers" OR DE "VOCAL coaches"
2. singer OR vocalist OR (vocal OR singing)adj2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
3. 1 OR 2
4. (((((DE "VOICE disorders" OR DE "LARYNGEAL diseases" OR DE "HOARSENESS" OR DE "MUSCLE tension dysphonia" OR DE "VOCAL cord injuries") OR (DE "APHONIA")) OR (DE "LARYNGITIS" OR DE "LARYNGEAL edema")) OR (DE "VOICE change")) OR (DE "VOCAL fold nodules")
5. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
6. 4 OR 5
7. 3 AND 6

CINAHL COMPLETE

1. (MH "Performing Artists")
2. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
3. 1 OR 2
4. (MH "Voice Disorders") OR (MH "Dysphonia, Muscle Tension") OR (MH "Laryngeal Diseases") OR (MH "Laryngeal Edema") OR (MH "Laryngitis") OR (MH "Aphonia") OR (MH "Hoarseness") OR (MH "Phonotrauma") OR (MH "Vocal Cord Hemorrhage")
5. (voice OR vocal)N5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
6. 4 OR 5
7. 3 AND 6

PSYCINFO

1. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
2. (MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Dysphonia")
3. (voice OR vocal)N5(problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
4. 2 OR 3
5. 1 AND 4

AMED

1. singer OR vocalist OR (vocal OR singing)adj2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
2. "Voice Disorders" OR Dysphonia OR laryngeal disease
3. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
4. 2 OR 3
5. 1 AND 4

EMBASE

1. singer OR vocalist OR (vocal OR singing)adj2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
2. Voice Disorders/ OR Aphonia/ OR dysphonia/ OR larynx disorder/ or hoarseness/ or laryngitis/ or larynx edema/ or larynx injury/ or larynx pain/
3. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
4. 2 OR 3
5. 1 AND 4

MUSIC PERIODICALS

1. singer OR vocalist OR (vocal OR singing)adj2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
2. (MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Aphonia") OR (MH "Dysphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngitis")
3. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
4. 2 OR 3
5. 1 AND 4

COMMUNICATION SOURCE COMPLETE

1. singer OR vocalist OR (vocal OR singing)adj2(coach OR teacher OR performer) OR tenor OR soprano OR choir OR bass OR opera OR operatic OR baritone OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk
2. (MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Aphonia") OR (MH "Dysphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngitis")
3. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
4. 2 OR 3
5. 1 AND 4

GREY LITERATURE SOURCES

OPENGREY AND BASE

Singer* AND voice (problem* OR disorder*) OR vocal (problem OR disorder OR symptom*)

Appendix 2.2: Table with studies excluded from the systematic review on self-reported voice problems and reasons for exclusion

Study name	Study title	Reason for exclusion
Aaen (2019)	Assessing and Quantifying Air Added to the Voice by Means of Laryngostroboscopic Imaging, EGG, and Acoustics in Vocally Trained Subjects	Not classical singers
Anderson (2018)	Immediate Effects of External Vibration vs Placebo on Vocal Function Therapy in Singers: A Randomized Clinical Trial	Not self-reported voice problems
Baker (2002)	Persistent dysphonia in two performers affecting the singing and projected speaking voice: a report on a collaborative approach to management	Not self-reported voice problems
Baker (2017)	University Vocal Training and Vocal Health of Music Educators and Music Therapists	Not classical singers
Barillari (2016)	Is Menstrual Dysphonia Associated With Greater Disability and Lower Quality of Life?	Not classical singers
Cammarota (2007)	Reflux symptoms in professional opera choristers	Reflux only
Carroll (2006)	Objective measurement of vocal fatigue in classical singers: a vocal dosimetry pilot study	Not self-reported voice problems
Claros (2017)	The effects of pregnancy on the voice of opera singers: our experience	Foreign language
Claros (2017)	A study of the effects of the menopause on the voice of opera singers	Foreign language
Cobzeanu (2012)	Laryngeal morphological changes due to gastroesophageal reflux disease	Reflux only
Cobzeanu (2013)	Environmental factors associated with dysphonia in professional voice users	Full-text unavailable
Dastolfo-Hromack (2016)	Singing voice outcomes following singing voice therapy	Not classical singers
Doherty (2017)	Personal and Professional Characteristics of Music Educators: One Size Does Not Fit All	Not classical singers

Study name	Study title	Reason for exclusion
Drew (1995)	Average speaking fundamental frequency in soprano singers with and without symptoms of vocal attrition	Not self-reported voice problems
Drumm (2017)	Roles for leading ladies: investigating the influence of ovarian hormones on performance anxiety and vocal impairment in elite singing	Publication type-Dissertation
Ebersole (2018)	The Influence of Occupation on Self-perceived Vocal Problems in Patients With Voice Complaints	Not classical singers
Fortes (2007)	Profile of voice professionals seen in a tertiary health center	Not self-reported voice problems
Franca (2015)	Effects of vocal demands on voice performance of student singers	Not classical singers
Garzón (2017)	Voice Habits and Behaviors: Voice Care Among Flamenco Singers	Not classical singers
Lenti	Gastroesophageal reflux disease in professional opera soloists	Duplicate
Lenti	Gastroesophageal reflux disease in professional opera soloists	Reflux only
Hamdan (2006)	The use of a screening questionnaire to determine the incidence of allergic rhinitis in singers with dysphonia	Not classical singers
Hočevar-Boltežar	Is an occupation with vocal load a risk factor for laryngopharyngeal reflux: a prospective, multicentre, multivariate comparative study	Reflux only
McGarey (2020)	Treatment of Vocal Fold Polyps with In-Office Potassium Titanyl Phosphate (KTP) Laser Ablation in Professional Singers	Not classical singers
Mezzedimi (2018)	Kinesio Taping Application in Dysphonic Singers	Not classical singers
Miller and Verdolini (1995)	Frequency and risk factors for voice problems in teachers of singing and control subjects	Not classical singers
Milovanovic (2018)	Relationship between socio-demographic characteristics and vocal fold nodules, polyps and oedema	Not classical singers
Mishra (2000)	24 hours prior to curtain	Not self-reported voice problems

Study name	Study title	Reason for exclusion
Monti (2017)	What's in a singer's voice: The effect of attachment, emotions and trauma	Not classical singers
Murry (2007)	Voice handicap in singers	Not classical singers
Nacci (2019)	Endoscopic and Phoniatric Evaluation in Singing Students	Not classical singers
Nam (2019)	Effects of Voice Therapy Using the Lip Trill Technique in Patients With Glottal Gap	Not classical singers
Ouyoung (2018)	Effects of Resonance Voice Therapy on Hormone-Related Vocal Disorders in Professional Singers: A Pilot Study	Not classical singers
Pabon (2014)	Effects on vocal range and voice quality of singing voice training: the classically trained female voice	Not self-reported voice problems
Petty (2012)	Health information-seeking behaviors among classically trained singers	Not self-reported voice problems
Pregun (2009)	GERD: Work-related disease?	Duplicate
Pregun (2009)	GERD: Work-related disease?	Reflux only
Ravall (2020)	Voice Disorders and Voice Knowledge in Choir Singers	Not classical singers
Renk (2017)	VHI-10 and SVHI-10 Differences in Singers' Self-perception of Dysphonia Severity	Not classical singers
Ryan (2006)	Effects of premenstrual symptoms on young female singers	Publication type-Dissertation
Sandgren (2002)	Voice, soma, and psyche: a qualitative and quantitative study of opera singers	Not self-reported voice problems
Salehi (2014)	Laryngeal manual therapy as a treatment for impaired production of tahrir vibrato in traditional Iranian singers	Full text unavailable
Sapir (1996)	Singers' and non-singers' vocal health, vocal behaviours, and attitudes towards voice and singing: indirect findings from a questionnaire	Full text unavailable
Sataloff (2012)	Prevalence of abnormal laryngeal findings in healthy singing teachers	Not self-reported voice problems

Study name	Study title	Reason for exclusion
Schwartz (2012)	Predictors of Choral Directors' Voice Handicap	Not classical singers
Sielska-Badurek (2017)	Combined Functional Voice Therapy in Singers With Muscle Tension Dysphonia in Singing	Not classical singers
Tay (2012)	The effect of vocal function exercises on the voices of aging community choral singers	Not classical singers
Tepe (2002)	A pilot survey of vocal health in young singers	Not classical singers
Timmermans (2002)	Poor voice quality in future elite vocal performers and professional voice users	Not classical singers
Vaiano (2013)	Body pain in classical choral singers	Not self-reported voice problems
Vaiano (2013)	Body pain in professional voice users: Voice complaints and effect on work	Not self-reported voice problems
Klodiana (2016)	Voice disorders in opera singers, Tirana	Publication type-non-peer reviewed article
Welham (2004)	Vocal fatigue in young trained singers across a solo performance: a preliminary study	Not self-reported voice problems
Wicklund (1996)	A Quantitative Survey of Premenstrual Syndrome and Menstrual Dysphonia Symptoms Experienced by Singer/Voice Teachers	Not classical singers
Galloway (1981)	A Survey of Communicative Disorders in College Vocal Performance and Pedagogy Majors	Full text unavailable

Appendix 2.3: Study and participant characteristics of studies included in the systematic review

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
1.	Achey (2016)	Cross-sectional	USA	Classical singing students	Students of two major conservatory voice programs.	104	NR	35	69	Mean=22 Range=17-63	n (%) 1. Solo performance=84 (81) 2. Solo performance + education=4 (3.8) 3. Education (university or grade school=4 (3.8) 4. Personal enjoyment=12 (12)	Mean years of training (SD) n=102 7.6 (3.9)
2.	Arunachalam (2014)	Cross-sectional	India	Carnatic singers	Carnatic singers with voice problems who reported to a tertiary care hospital with various voice concerns.	45	NR	9	36	Mean=39.7 (13.43) Range=18-74	Mean years of experience in singing (both training and performance) Females=23.80 (SD:12.87) Males=20.90 (SD: 10.55)	NR
3.	Avila (2010)	Cross-sectional	Brazil	Opera singers	Professional singers from São Paulo	59	NR	26	31	Mean=32.82 Range=20-75	Classification according to vocal type Soprano: n=22 Mezzo- soprano: n=10 Contralto: n=1 Tenor: n=13 Baritone: n=10 Bass: n=3	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
4.	Berghs (2013)	Cross-sectional	NL	Classical choir	Choral singers between the age range of 20-60 years	47	50	16	31	Range=21-60	1.Classification according to vocal type Sopranos: n=24 Altos: n=8 Tenors: n=3 Basses: n=12 2. Singing activities a. Giving singing lessons: n=21 (44%) b. Singing as a soloist: n= 42 (88%) c. Singing in other vocal ensembles: n=27 (57%)	1. Graduated at conservatory: n=33 (92%) 2. Taking singing lessons: n=21 (44%)
5.	Boulet (1996)	Cross-sectional	Belgium	Western Classical singers	Professional singers	72	NR	24	48	Range=40-74	1. Solo performer=47 2. Operatic choral singer Female=13 Male=10 3. 3. Other Female=1 Male=1	NR
6.	Caffier (2017)	Cross-sectional	Germany	Western Classical singers	Professional voice users with vocal fold nodules	24	NR	NR	NR	Mean age (SD)=38 (12)	NR	NR
7.	Castelblanco (2014)	Cross-sectional	USA	Western Classical singers	1. Adult professional singers 2. No known current vocal problems	47	NR	NR	NR	Mean=31 Range=19-62	1. Singing status a. Professional entertainment: n=34 (72.3%) b. Voice teacher: n=22 (46.8%) c. Singing student: n=20 (42.6%)	1. Classically trained: n=45 2. Undergraduate

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											d. Choir/singing group: n=4 (8.5%) 2. Years singing a. 1–5: n=2 (4.3%) b. 6–10: n=17 (36.2%) c. 11–20: n=16 (34.0%) d. 21–30: n=5 (10.6%) e. 30+: n=7 (14.9%)	degree: n=40 3. Graduate degree: n=25 4. Voice lessons: n=47
8.	Clarós (2018)	Retrospective review	Spain	Opera singers	Inclusion: All patients over the age of 18 years presenting arytenoid asymmetry Exclusion: All patients with a history of surgery or laryngeal disease, such as nodules, polyps, cysts and other tumours	250	NR	124	121	Mean=38.54 Range=18-85	NR	NR
9.	Clarós (2019)	Retrospective review	Spain	Opera singers	Inclusion: 1. Adult professional opera singers who underwent rhinoplasty	18	NR	2	16	Mean=28 Range=20-40	Classification according to vocal type Sopranos-n=8 Mezzos-n=5 Contralto-n=2 Unclassified-n=1	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
					between 2000 and 2012 Exclusion 1. Associated allergic, vasomotor rhinitis, or pathology of the paranasal sinuses objectified by a head CT scan. 2. Previous nasal surgery, or any organic or functional disorder of the larynx and previous surgeries. 3. Psychic liability, psychiatric or behavioural disorders, under anxiolytic treatment						Tenor-n=1 Baritone-n=1	
10.	Cohen (2008)	Cross-sectional	USA	Classical singers	NR	61	NR	24	37	Mean=38.7 Range=18-81	Income from singing: Not a source of income: n=50.9%; Secondary source of income: n=23.4%; Primary source of income: n=22.2% Singing status:	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											Professional: n=40.9%; Amateur: n=24%; Singing teachers: n=12.9%; Singing students: n=16.4%	
11.	Davis (1993)	Cross-sectional	USA	Classical singers	1. Females 2. Participation in supervised singing activities for a minimum of 2 years.	104	NR	0	104	Range=21-42	1. Breakdown of participants according to voice type a light- or high-voice type: n=49 (47.2%) b. Literature for heavy- or low-voice type: n=52 (49.9%) c. Other: n=3 (2.9%) 2. Sung in public for 5 years: n=81 (77.9%)	NR
12.	Devadas (2018)	Cross-sectional	India	Carnatic singers	1. Singers between the age of 18-60 years 2. Involved in singing actively for more than 2 hours/week over the past 12 months (Rehearsal, teaching or in public)	190	94	41	149	Mean=38.1 (15.1) Range: 16-78	1. Singing experience > 15 years=69% 2. Practice singing 1-3 hours/day=56% 3. Starting singing career at 10 years of age=75%	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											4. singers practising warm up-exercises=79%	
13.	Elliott (2017)	Cross-sectional	USA	Classical singers	NR	80	NR	0	80	Range*=47-79	NR	NR
14.	Heman-Ackah (2002)	Cross-sectional	USA	Singing teachers	NR	20	NR	3	17	Mean=50 Range=22-76	1. Vocal classification of participants: a. Soprano: n=13 b. Mezzo-Soprano: n=3 c. Alto: n=1 d. Baritone: n=3	NR
15.	Kaneko (2019)	Pre-post design	Japan	Classical singers	NR	8 singers 8 non singers	NA	4	4	Mean=64 Range=19-74	NR	NR
16.	Karulkar (2021)	Cross-sectional	India	Hindustani singers	1. Self-identified and trained Hindustani classical singers 2. More than one year of training.	61	NR	13	48	Mean=37.8 (12.9) Range=18–68	1. singing as primary profession=45.9% 2. Other professional demands=73.8% 3. Avg singing practice duration=70 min (20-240 mins) 4. Avg singing experience=10 years (1-33 yrs) Stage performers=92%	1. Singing training experience: range=1 to 45 years Mean=12.1 years

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
17.	Kitch (1994)	Cross-sectional	Australia	Classical singers	1. Actively involved in the singing professions over the last 12 months in a semi-professional or professional manner.	10	NR	2	8	Mean=29.8	1. Range of experience=3-40 2. Current performance a. Range=0.2-5performances/month b. mean=2.5 performances/month 3. Voice practice a. Range: 0.25-2hrs/day b. Mean: 38.5 min/day	Training experience range: 0-10 years
18.	Lã Filipa (2007)	Qualitative case study	United Kingdom	Classical singers	NR	1	NA	0	1	Participant's age=27	NR	NR
19.	Lam (2008)	Cross-sectional	Canada	Classical singers	Exclusion 1. Less than 4 years of continuous voice training; 2. Outside the age range of 18–40 years; 3. Less than 20 hours per week of voice use for singing; 4. Abnormal appearance or function of the larynx upon visualization with	8	NR	0	8	Range=19-35	Solo performers: n=7	1. Range of training (years): 4-16 years 2. Trained singers: n=8

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
					rigid laryngeal endoscopy; 5. Abnormal acoustic voice properties when compared with norms reported in Colton and Casper; 6. Laryngeal surgery or trauma to the larynx; 7. Voice, neurogenic, psychogenic, or swallowing disorders; 8. Gastroesophageal reflux disease; 9. Hormone imbalance or disorder; 10. Menopause or hormone therapy; 11. Previous voice therapy; 12. Smoking within the last 5 years; 13. Consumption of alcohol within 48 hours of the study; 14. Consumption of caffeine within 24 hours of the study; 15. Less than 64 oz							

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
					of water per 24 hours for 48 hours before study; 16. Inability to tolerate rigid laryngeal endoscopy or perform tasks during endoscopy; 17. Severe anterior-posterior or medial squeezes in larynx that obscure the view of the vocal folds; 18. Use of prescription medications known to cause changes in laryngeal structures, function, mucosa, or muscle activity; 19. Presence of symptoms of cold or flu in past 48 hours 20. Perceptual judgment of ''dysphonic'' during phone interview screening.							
20.	Loiola-Barreiro (2016)	Cross-sectional	Brazil	Western Classical singers	Engaged in professional singing for at least one year.	58	NR	29	29	Mean =31.8	1. Vocal classification: a. Soprano: n=22 (37.9%)	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											b. Mezzo soprano: n=7 (12.1%) c. Tenor: n=22 (37.9%) d. Baritone: n=6 (10.6%) e. Bass: n=1 (1.7%)	
21.	Lundy (1999)	Longitudinal	USA	Classical singing students	Absence of vocal difficulties while testing	27*	NR	Unav*	Unav*	Mean*=23.52 Range*= 18-39	1. Classification of students based on voice type* a. Soprano: n=33; b. Alto: n=9; c. Tenor: n=11; d. Bass: n=4 2. Lessons (h/wk)*: 1.14 hrs 3. Rehearsal (h/wk)*: 5.07 hrs 4. Performance (h/wk)*: 1.34 hrs 5. Mean years of professional Experience*=12.6 years	NR
22.	Moreti (2012)	Cross-sectional	Brazil	Western Classical singers	NR	All genres=118 Western classical=59	NR	Unav*	Unav*	Mean=29.5	NR	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
23.	Paoliello (2019)	Cross-sectional	Brazil	Classical singers	Exclusion: peripheral hearing loss	All genres=47 Classical=12	NR	Unav*	Unav*	Mean=28.93	Average singing experience=12.22*	NR
24.	Phyland (1999)	Cross-sectional	Australia	Opera singers	Inclusion 1. Aged between 18 to 69 years 2. Professional singers according to their own identification 3. Received an income from singing in public over the previous 12 months. 4. Sung more than 2 hours per month on average during the previous year and have to have sung more than 50% of their total singing time in opera.	Opera=84	56.2% *	Unav*	Unav*	Mean=36.97 Range=18-72	Number of performance hours per month=15 hours*	NR
25.	Prior (2020)	Cross-sectional	Brazil	Classical singers	Female classical singers with a minimum of 1 year of professional experience	55	NR	0	55	Mean=37±11 years	1. Distribution according to vocal type a. Soprano: n=44 (79.5%) b. Mezzo- soprano: n=8 (15.4%)	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											c. Contralto: n=3 (5.1%). 2. Rehearsal time over the quarantine period=7.4 (+/) 4.8 hours/week 3. Study time: 6.2(+/-)5.8 hours/week. 4. Professional experience a. professional for 1 year: n=2 (3.6%) b. professional for 2 years: n=3(5.5%) c. professional for 3 years: n=2 (3.6%), d. professional for 4 years: n=5 (9.1%), e. professional for 5 years, or more: n=43 (78.2%)	
26.	Ragan (2016)	Pre-post design	USA	Female classical singers	NR	19	NA	0	19	Mean=22.85 (3.54)	NR	Mean (SD) years of study/training=7.85 (3.44)
27.	Randolph (2015)	Pre-post design	USA	Classical singers	Inclusion: 1. voice professional where voice was significantly	12	NA	Unav*	Unav*	Mean*=44.8	NR	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
					involved in their profession							
28.	Rezende (2015)	Cross-sectional	Brazil	Classical choir	Inclusion 1. Regular participants in rehearsals and performances of CORUFS Exclusion: 1. Presence of some self-vocal complaints referred from diseases not related to the use of singing voice 2. duration of singing in the choral group <5 months	32	NR	12	20	Range=20-60	1. Experience a. Less than one year: 9.38% (n=3) b. Between 1 and 5 years: 21.88% (N=7) c. Between 5 and 10 years: 12.50% (N=4) d. More than 10 years: 56.25% (N=18) 2. Voice classification a. Soprano: n=11 b. Alto: n=9 3. Tenor: n=6 4. Bass: n=6	NR
29.	Rodica-Elena (2017)	Prospective Cross-sectional	Romania	Classical Canto students	Classical Canto students at the Music Academy, Cluj-Napoca	40	NR	16	24	Mean=20 Range=19-24	Classification according to voice type a. Soprano: n=15 b. Mezzo- Soprano: n=7 c. Tenor: n=5 d. Baritone: n=8 e. Bass: n=5	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
30.	Ropero (2018)	Cross-sectional	Germany	Classical singers	1. Professional and semi-professional singers, recognized amateurs, and singing teachers suffering from dysphonia and/or dysodia 2. Lack of spontaneous remission, complete treatment documentation 3. Informed consent.	50	NR	9	41	Range*=17-64 years	NR	NR
31.	Rosen (2000)	Cross-sectional (with comparison group)	USA	Classical singers	1. Professional singers: Either pursuing a university degree in vocal performance or individuals who made their primary living singing. 2. Controls: Non singers	Singers=38 Controls=369 Total=407	NR	NR	NR	Mean*=35 Range*=11-71	NR	NR
32.	Ryan (2009)	Longitudinal	Australia	Western Classical singers	Singing students from the Sydney Conservatorium of Music, Australia	27	NR	6	21	Males Age range=19-29 Females Age Range=18-27	1. Singing years a. Males=3-9 years b. Females=2-16 years 2. Classification according to voice type	NR

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											a. Soprano: n=19 (91%) b. Mezzo Soprano: n=2 (9%) c. Baritone: 4 (67%) d. Tenor: 1 (17%) e. Counter tenor: 1 (17%)	
33.	Schloneger (2011	Case study	USA	Opera singers	Females only	2	NR	0	2	NR	1. Female graduate voice performance students at a major Mid-Western university, double cast in principal roles of a university production. 2. Graduate teaching assistants in voice.	NR
34.	Sapir (1993)	Cross-sectional	USA	Classical singing students	1. Females only 2. graduate and undergraduate voice students at the Northwest-ern University School of Music.	74	NR	0	74	Mean=20.5 (2.7) Range=18-31	1. Distribution according to vocal classification a. Soprano: n=62 (84%) b. Mezzo soprano: n=11 (15%) c. Contralto: n=1 (1%) 2. Average number of hours of singing per week =13.9 +- 6.9 h	1. Education level a. Undergraduates n=59 (80%) b. Graduates: n=15 (20%)

Study no:	Study name	Study type	Country	Population	Eligibility Criteria	Sample size (n)	Response rate (%)	Sex		Age in years Mean (SD) Range As applicable	Singing related details	Training related details
								M	F			
											3. Average number of years of vocal performance=7.0 +-3.6 years.	
35.	Vermeulen (2020)	Randomised pre test post test design	Belgium South Africa	Female classical singers	1. aged 32 years or younger 2. female singers not diagnosed with previous voice disorders 3. no current infections or disease affecting vocal fold functioning	24	NA	0	24	Mean=21.38 (2.6)	Average rehearsal duration=10 hours a week (SD=5.51)	NR

*Table 2.1: *=Values are not pertaining to classical singers only and represents the entire study population-therefore includes other genres as well; Unav=Unavailable for classical singers only; NR=Not Reported; NA=Not Applicable; SD=Standard Deviation*

Appendix 2.4: Synthesis of objectives, measures and outcomes of the systematic review on self-reported voice problems

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
Achey (2016)	1. Explore the relationship between self-reported vocal hygiene practice and self-reported vocal health	Likert scale 0-4 (never to always)	1. The Vocal Hygiene Index 2. SVHI-10	NA	1. Paired t test for each individual category and overall score between non-performance and performance periods and to compare the overall scores for gender and age categories 2. Multiple linear regression models to assess if consideration of individual vocal hygiene and vocal health factors predict SVHI-10 score.	NA	1. Mean SVHI-10 (SD, range) =12 (6.1, 0 to 29) a. 41 (39%) had an SVHI-10 score >14, indicating possible vocal problems. b. 4 (3.8%) had scores >21.5, the mean value for dysphonic singers in the original validation study.	1. Conservatory classical students report a moderately elevated degree of vocal handicap
Arunachalam (2014)	1. Report the nature of voice problems in Carnatic singers	VAS 100mm VAS (0-Never, 100-Always)	Voice Disability Outcome Profile-V-DOP	Structured interviews to elicit symptoms reported by the singers and obtain relevant information on onset and	1. Percentage analysis to document symptoms reported by the Carnatic singers.	Subjective vocal symptoms-% and (avg. duration-months) 1. Change in voice=42.2% (2.5) 2. Difficulty in singing higher pitches=35.5% (2) 3. Difficulty in reaching lower pitches=31.1% (1.5)	I. V-DOP overall severity=5.1/10 II. Individual domain scores-mean and (SD) 1. Severity=5.1 (2.7) 2. Physical=40.4 (21.5) 3. Emotional=39 (23.1) 4. Functional=31 (24.2)	1. Symptoms commonly reported by singers were profiled. 2. Overall severity score of 5.1 in V-

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
				progression of the voice problem, vocal and non-vocal habits etc.		4. Discomfort and pain while singing =26.7% (2) 5. Difficulty in sustaining voice for a long duration=22.2% (3) 6. Throat tightness and strain=22.2% (2) 7. Dryness of throat and vocal fatigue =20% (6) Range of duration of symptoms =1.5 to 6 months	5. Total=110.24 (73.20)	DOP revealed self-perceived severity in overall voice quality.
Avila (2010)	1. Determine which handicaps are produced by a vocal problem 2. Identify whether there are any relations to gender, age, vocal classification or total singing duration in Classical singers with and without	Likert scale 0-4 (never to always)	Classical Singing Handicap Index (CSHI)-	Info regarding vocal classification, age, education, total dedication time to opera singing, voice quality, voice problems and presence of vocal symptoms (burning, itching, pain, dryness feeling, burning sensation, tightness or	1. The Mann-Whitney to compare the groups based on gender. 2. Wilcoxon test to determine differences between the subscales. 3. The Spearman correlation to measure the degree of relationship between the scales of IDCC with the other quantitative variables.	1. Presence of vocal complaint-n (%) a. Singers with at least 1 vocal complaint=17 (27.86%) b. Singers with no vocal complaints/less than 2 vocal symptoms=42 (72.18%) 2. Only 36.36% of participants from the group without vocal complaints reported symptoms a. Fatigue (22.72%) b. itch (6.81%) 4. All participants from the group with vocal	(I) CSHI scores of groups with and without complaints: Mean and [SD] 1. Disability Group without VC=2.83 [2.7] Group with VC=11.71 [6.43] p value: 0.044* Combined: 5.39 [5.74] 2. Handicap Group without VC: 1.62 [2.52] Group with VC: 7.59 [6.29] Combined: 3.34 [4.78] 3. Impairment Group without VC: 4.14 [3.94]	1. The vocal symptoms experienced by operatic singers are presented 2. Disability subscale scores showed a significant difference between genders with women having greater scores indicating

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	vocal complaints.			ball sensation, vocal fatigue and hoarseness)		complaints reported symptoms: a. Tiredness (76.47%) b. Dryness (41.17%) c. Pain (35.29%)	Group with VC: 11.94 [6.15] Combined: 6.39 [5.84] 4. Total score Group without VC: 8.6 [6.94] Group with VC: 31.24 [17.47] Combined: 15.12 [15.01] 5. Comparison of disability, handicap, impairment and total score between groups with and without VP: p=<0.001	higher levels of disability
Berghs (2013)	1. Investigate to what extent easily obtainable voice parameters were age-related	NR	NA	Demographics, vocal activities and self-perception of voice quality changes over the years	1. Descriptive statistics to measure frequency	Negative developments in singing over the years like more vocal fatigue and limitations in the higher notes: n=21 (44%)	NA	Vocal fatigue and difficulties singing higher notes are reported in relation to age.
Boulet (1996)	1. Determine whether women experience voice changes at around the time of menopause	Open ended questions	NA	Info regarding voice changes observed over a 12-month period, nature and causes of changes, beliefs	Descriptive statistics	1. Respondents' perceptions regarding voice changes around age 50: % and (n) a. Voice generally changes: Women: 77% (37) Men: 71% (17) b. Voice does not change:	NA	The problems with voice emission, voice control and attainment of the highest registers

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
				regarding voice changes at around the age of 50, effect of contraceptive pills or menstruation on voice and demographics		Women: 15% (7) Men: 17% (4) c. Do not know/No opinion: Women: 8% (4) Men: 13% (3) 2. Types of voice changes associated with fifth decade of life-% and (n) a. Husky: Women: 25% (9) Men: 6% (1) b. Loss of top notes: Women: 69% (25) Men: 47% (8) c. Change in timbre: Women: 44% (16) Men: 47% (8) d. Less supple vocal cords: Women: 72% (26) Men: 47% (8) e. Voice less steady: Women: 36% (13) Men: 24% (4)		seemed to occur more typically in women than in men (not statistically determined)
Caffier (2017)	Compare and quantify results after phonomicrosurgery for vocal fold nodules in	Likert scale 0-4 (never to always)	VHI-10	NA	Descriptive statistics	NA	VHI scores Mean (SD)=16 (7)	Singers with vocal nodules indicate elevated levels of vocal handicap

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	professional voice users							
Castelblanco (2014)	1. Correlate SVHI results with videostrobolaryngoscopy findings of healthy professional singers. 2. Examine the ability of professional singers to self-assess their vocal health.	Likert scale 0-4 (never to always)	1. SVHI	NA	1. Pearson correlation to assess correlation between videostrobolaryngoscopy and SVHI. 2. Linear regression to determine if total pathology predicted SVHI	NA	SVHI scores a. Mean (SD)=22.4 (16.33) b. Range= 0 to 72 c. The standard deviation in the SVHI total scores (by individual) was 16.33.	The SVHI scores were as expected from healthy classical singers
Clarós (2018)	Evaluate the impact of arytenoid asymmetry on the voice in a group of healthy opera singers	NR	NA	Info on vocal symptoms	Descriptive statistics	Symptoms related to arytenoid asymmetry 1. occasional dysphonia: (n=4%) 2. pharyngeal dryness:(n=2%) 3. vocal fatigue (n=2%)	NA	Arytenoid asymmetry does not correlate with vocal symptoms
Clarós (2019)	1. Identify the effect of rhinoplasty on professional	Likert scale 0-4 (never to always)	1. VHI-10 (Spanish)	Info on voice characteristics and surgery evaluation such as	1. The mean and SD of VHI-10 scores before and after surgery was calculated	a. Hyponasal character prior to surgery: n=5 (27.7%)-normalised post-surgery	VHI-10 scores before and after surgery-Mean and [SD] a. Before surgery: 5.3 [2.6]	1. 27.7% of singers perceived hypernasality

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	opera singers' perception of their voice.	-Yes/No -Variable		a. presence of hyponasal voice b. overall voice status after surgery	(descriptive statistics)		b. After surgery: 5 [1.2]	prior to surgery. 2. VHI-10 score did not show a significant change pre and post-surgery.
Cohen (2008)	Examine potential predictors of the patient-perceived voice handicap among singers as measured on the SVHI.	Likert	SVHI	NA	1. Descriptive analyses	NA	SVHI SCORES Mean 39.2, SD 19.2	1. Singers experienced impaired voice handicap as a result of their voice problem
Davis (1993)	1. Evaluate the degree to which a wide range of general symptoms and vocal changes associated with Pre menstrual	Likert scale 1. 1 = rarely" to "5 = always." 2. "1 = not at all" to "5 =severely"	NA	a. Identifying the presence of vocal symptoms associated with PMS b: Overall degree of disruption caused by PMS symptoms	Descriptive statistics	1. 8 most cited vocal symptoms in descending order a. Difficulty singing high notes b. Flexibility impairment c. Husky quality d. Fuzzy quality e. Decreased volume f. Breathy quality	NA	1.Vocal symptoms may manifest as a result of PMS. 2. Some singers' personal and professional lives have

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	Syndrome (PMS are experienced by trained female singers in relation to their premenstrual interval.			c. Demographics menstrual history, professional status		g. Difficulty bridging the passaggio(s) h. Intonation problems. 2. The average singer had experienced 3 vocal symptoms of PMS. a. Frequency- "sometimes" b. Degree of life disruption-"moderate"		been disrupted by the effects of PMS
Devadas (2018)	1. Determine the current and past prevalence and nature of VPs, vocal symptoms and variables that may be associated with increased risk of voice problems in Carnatic singers.	1. Yes/No 2. Variable	NA	Info regarding Demographic details, singing related details, prevalence and characteristics of voice problems, description of phonotraumatic behaviours, lifestyle and health related factors, impact of voice problem and voice care	1. Descriptive statistics to calculate prevalence 2. Pearson's Chi-Square test to determine the difference in demographic details, occupation, and training-related details, phonotraumatic behaviors, lifestyle factors, and health-related factors between singers with VP and without VP.	1. Self-reported voice problems in Carnatic singers (descending order of frequency) a. Vocal fatigue b. Trouble reaching higher notes c. Change in voice quality d. Reduced pitch range e. Discomfort in the throat f. Effortful production of voice g. Loss of vocal endurance h. Dryness in throat i. Hoarseness in higher pitch range j. Trouble singing loudly k. Difficulty in register transition l. Tightness in throat m. Reduced breath support	NA	1. Carnatic singers are at risk of developing voice problems 2. Most singers reported multiple vocal symptoms with vocal fatigue, trouble reaching higher notes, change in voice quality, reduced pitch range and discomfort in

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
					3. Adjusted odds ratio with a 95%confidence interval with multiple logistic regression with forward Wald selection criteria to investigate the association between the presence of VP and the different risk factors.	n. Momentary loss of voice o. Pain in throat p. Frequent coughing q. Complete loss of voice 2. Career Prevalence=35.26% 3. Point prevalence=22.6% 3.) Nature of VP a. static: 76.1% (n=51) b. progressive: 23.9% (n=16) 3. Onset of VP a. sudden: 40.3% (n = 27) b. gradual: 59.7% (n = 40)		the throat being most prevalent.
Elliott (2017)	Examine voice changes of singers going through menopause	1. Open ended questions 2. Multiple choice	NA	Info regarding age, voice range and type, medical history related to menopause, vocal changes before and after menopause, practice, performing and teaching habits, diet etc.	1. Descriptive statistics	I. Most common vocal changes post menopause a. Flexibility: n=78.90% b. Colour: n= 70.09% c. Power: n=79.44% d. Stiffness: n=71.15 e. Upper passaggio: n=75.00 f. Vibrato: n=71.70 II. How long after you stopped menstruating did you notice vocal changes? n(%) 1. 1-3 months: 16 (17%) 2. 3-6 months: 16 (17%) 3. 6-12 months: 13 (14%) 4. 1-3 years: 26 (27%)	NA	1. Many female singers experience voice changes as they transition through menopause. 2. Symptoms include decreased range, strength flexibility, vibrancy and endurance,

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
						5. 3-5 years: 11 (11%) 6. Longer: 14 (15%) 7. Total: 96 (100%)		changes to vibrato and sound quality.
Heman-Ackah (2002)	1. Examine the incidence of laryngeal pathology among singing teachers.	NR	NA	Info regarding personal singing and medical histories and vocal and technical complaints	NA	1. Vocal complaints (n=4) a. Volunteer 1: Hoarse, Fatigue, Trouble with soft phonation and high range b. Volunteer 2: Trouble with high range c. Volunteer 3: Fatigue, Trouble with low range d. Volunteer 4: Fatigue, trouble with high range 2. Technical complaints of volunteers a. Volunteer 5 Fatigue, Trouble with soft phonantion b. Volunteer 6 trouble with soft phonation c. Volunteer 7 Trouble with register transition	NA	Singers complained of a variety of vocal issues pertaining to fatigue, range, volume and voice quality.
Kaneko (2019)	Evaluate vocal tract function and voice quality	Likert	VHI-10 SVHI-10	NA	Paired t test	NA	VHI-10 Mean and SD=14 (±10) CI: 20.9-7.2 SVHI-10	1.Baseline scores showed an increased

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	in singers and nonsingers with dysphonia after administering SOVTE.						Mean and SD=27.8 (±10) CI: 34.7-20.8	level of vocal handicap
Karulkar (2021)	Profile voice-related complaints and vocal and non-vocal habits among Hindustani classical singers	1. 3 point (Almost, sometimes, never) Likert scale 2. yes/no scale 3. Open ended	NA	Info regarding singing related information, vocal complaints, vocal behaviours, health and lifestyle habits.	Descriptive statistics to summarise data. Continuous data was summarized using mean and standard deviation, frequency and percentage was used for categorical data.	1. Vocal symptoms in descending order of frequency a. Out of breath while singing=46 b. Feeling tired after singing=37 c. Tension=36 d. Feeling tired after talking=29 e. Loss of voice=23 f. Out of breath while talking=15 2. Singers reporting at least three vocal symptoms-41%	NA	Vocal symptoms reported by Hindustani singers are reported with the most common symptom being out of breath while singing and vocal fatigue
Kitch (1994)	Delineate performers' perceptual experiences during an episode of vocal in singers	1. Likert scale 1-5 (normal, minimally affected, moderately affected,	NA	Info regarding age, amount of voice practice, drug and alcohol use, frequency of vocal fatigue during	1. Descriptive statistics to plot percentages of subjects who noted changes in vocal parameters during vocal fatigue	1. Percentage of singers with voices moderately to severely affected when experiencing vocal fatigue (up to 50% freq.) a. Pitch range=90% b. Optimal Quality: 80%	NA	1. A large percentage of singers experience vocal fatigue 2. Vocal fatigue

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
		severely affected, very severely affected) 2. Open ended questions		performance, voice-related changes, including self-rating of voice when vocally fatigued		c. Hoarseness: 70% d. Pitch flexibility: 60% e. degree of pushing voice: 60% f. brightness: 60% g. Constriction while sustaining: 60% h: Pitch note: 60% i: Place voice: 60% j: Energy levels: 50% k: Constriction while singing: 50% l: Sustain long notes: 50% m: Sustain long phrases: 50% n: Tone termination: 50% o: fine adjustment in loudness: 50% p: Loudness range: 50%		causes changes in various vocal attributes
Lã Filipa (2007)	1. Examine impact of menstrual cycle on voice 2. Impact of oral contraceptives on the voice and in minimising impact of changes induced by	NA	NA	Semi structured interview	Thematic analysis	Vocal issues described: Less focussed; less 'bright' voice; heaviness creating difficulties singing staccatos; less vocal flexibility; reduced vocal support; increased muscle tension; singing high notes; long sustained phrases; less vocal control during menstrual cycle	NA	1. Hormonal variations during the natural menstrual cycle affected physiological and psychological aspects of the singer's performance

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	menstrual cycle							
Lam (2008)	Examine laryngeal and respiratory behaviour during tasks that required pitch modifications in professional singers.	Likert	VHI	NA	Descriptive statistics	NA	VHI scores of participants who showed a static pitch variation pattern (n=4) and a dynamic pattern (n=4) VHI-FUNCTIONAL Dynamic: 2.00 ± 2.45 Static: 5.60 ± 3.05 VHI-PHYSICAL Dynamic: 4.25 ± 2.87 Static: 3.60 ± 1.14 VHI EMOTIONAL Dynamic: 0.25 ± 0.50 Static: 1.40 ± 1.14 VHI-TOTAL Dynamic: 6.50 ± 4.20 Static: 10.60 ± 3.65 Combined VHI of static and dynamic computed below: VHI Functional: 4.25 (3.24) VHI Physical: 3.84 (1.79) VHI Emotional: 0.96 (1.08) VHI Total 9.06 (4.14)	Participants did not demonstrate a significant handicap in their total scores.

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
Loiola-Barreiro (2016)	Compare the voice handicap index of popular and erudite professional singers by means of the MSHI and CSHI protocols according to gender, age, professional experience time, and presence or absence of self-reported vocal complaints.	Likert scale 0-4 (never to always) -Open ended questions	Classical Singing Handicap Index (CSHI)	Info regarding demographics, singing related details, self-reported vocal complaints	Descriptive statistics and Mann-Whitney U test to correlate subscales between singers with and without vocal problems.	NA	I. Descriptive analysis of CSHI Mean (SD) 1. Without complaint (N=44) A. Total score=12.7 (14.5) B: Disability=4.5 (5.2) C: Handicap=3.3 (4.1) D: Impairment=4.9 (6.0) 2. With complaint (N=14) A. Total score=43.5 (25.0) B: Disability=14.9 (8.1) C: Handicap=12.2 (8.1) D: Impairment=16.4 (9.3) II. p values comparing groups with and without vocal complaint a. Disability, Handicap, impairment and Total score: p=<0.001	1. Significant differences were observed in all domains between singers with and without vocal complaints
Lundy (1999)	Investigate the incidence of laryngeal abnormalities in asymptomati	Open ended questions	NA	Info regarding background, medical, voice (vocal symptoms) and singing	1. Statistical analysis consisted of descriptive measures for all	1. History of vocal symptoms-Frequency (%) a. Hoarseness: 48 (84.2) b. Breathiness: 22 (38.6) c. Volume difficulties: 14 (24.6)	NA	Vocal symptoms were reported by asymptomati

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	c singing students.			histories, inventory of drying substances, history of reflux symptoms, voice usage	study factors	d. Pitch range: 28 (49.1) e. Voice worse in morning: 29 (50.9) f. Voice worse in evening: 12 (21.1) g. Throat clearing: 21 (36.8)		c singing students
Moreti (2012)	Investigate whether there are differences between popular and classical singing styles	Likert scale 0-4 (never to always)	CSHI	NA	Descriptive statistics	NA	I. CSHI mean (SD) scores 1. Classical singers with vocal complaints (n=17) A. Disability=11.7 (6.4) B. Handicap=7.6 (6.3) C. Impairment=11.9 (6.1) D. Total=31.2 (17.5) 2. Classical singers without vocal complaints (n=42) A. Disability=2.7 (2.7) B. Handicap=1.6 (2.5) C. Impairment=4.1 (3.9) D. Total=8.6 (6.9)	1. Highest scores were reported for Impairment, followed by disability and handicap. 2. Higher scores were observed in Classical singers with vocal complaint
Paoliello (2019)	1. Identify the relationship between perceived vocal quality, vocal symptoms, and auditory	Likert scale 0-4 (never to always)	1. VoiSS	NA	1. Statistical analysis consisted of descriptive measures (mean)	NA	Mean value of VoiSS score=20.5	The VoiSS scores of classical singers are slightly elevated (normative <15.5)

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	processing skills in subjects with and without musical experience.							
Phyland (1999)	Determine the prevalence of vocal impairment, disability and handicap in three groups of singers and a friendship-matched group of non-singers.	1. Likert scale Severity and impact on the speaking voice and singing voice on a 5-point Likert scale (no further details available) 2. Open ended questions	NA	Info regarding singers' vocal behaviours, vocal experience and vocal health for 12 months, vocal impairment, disability and handicap of speaking and singing voice	Descriptive statistics	I. Vocal Impairment: 1. Frequency of Symptoms of Vocal Impairment: n (%) a. Hoarseness: n=193 (75.1%) b. Voice-fatigue: n=178 (69.3%) c. Tickling/choking sensation while speaking: n=138 (53.6%) d. Pain in throat: n=135 (52.5%) e. Change in pitch of speaking voice: n=114 (44.3%) f. Difficulty with volume/projection: n=90 (35%) g. Lump in throat feeling while speaking: n=73 (28.4%) h. Strained or strangled voice: n=73 (28.4%) i. Voice breaks or stops when talking: n=71 (27.6%)	NA	1. Singers reported significantly higher prevalence rates of vocal disability and of diagnosed vocal conditions than non-singers. 2. Opera singers reported high prevalence rates of vocal disability and handicap

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
						j. Complete loss of voice: n=30 (11.6%) 2. The mean number of symptoms reported by the Opera group=6.33 II. Vocal Disability 1. Number of opera singers experiencing voice problems over past 12 months=67.1%		
Prior (2020)	1. Verify the impact of vocal deviation in the quality of life of classical female singers over the quarantine imposed by the COVID-19 pandemic through self-assessments.	Likert scale 0-4 (never to always)	CSHI	NA	-Statistical analysis 1. Descriptive statistics 2. Friedman's test to compare the 3 domains of the CSHI 3. Kruskal Wallis test to compare subscales of the CSHI with vocal classification 4. Spearman's test to correlate subscales with singing related variables	NA	I. Distribution and comparison between the average scores obtained in the CSHI protocol 1. Disability a. Mean (SD): 17.5(9.2) 2. Handicap a. Mean (SD): 15.9 (8.7) 3. Impairment a. Mean (SD): 14.2(10.0) 4. Total a. Mean (SD): 47.7 (25.2)	1. Singers maintained a standard of vocal quality through singing studies and rehearsals despite social isolation. 2. Singers reported reduced handicap during COVID-19 quarantine.
Ragan (2016)	Determine whether	Likert	SVHI	NA	Descriptive statistics (Mean)	NA	Mean SVHI score= 22.75	Singers experienced

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	1. Singers perceived any differences in their vocal function, vocal health, or tone quality when using vocal cool downs							elevated levels of vocal handicap
Randolph (2015)	Examine subjective and objective voice recovery following neural monitored thyroid surgery	Likert	VHI EASE	NA	Descriptive statistics-Mean	NA	VHI (mean) Physical=4.63 Functional=3.37 Emotional=3.26 Total=4.15 SVHI Mean=11.26 EASE (mean) Total score=6.19 EASE-Subscale 1 (physical symptoms of vocal impairment and fatigue)=3.93 EASE-Subscale 2 (mucosal issues such as oedema or VF pathology=2.63	1. No handicap reported by singers
Rezende (2015)	1. Compare the voice handicap	Likert scale	1. CSHI 2. VoiSS (Brazilian	NA	Descriptive statistics.	NA	CSHI scores: Impairment=28.75% Disability=15.79%	Impairment subscale of CSHI and

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	index with the propensity to dysphonia as perceived by the choristers of Universidade Federal de Sergipe	0-4 (never to always)	Portuguese)				Handicap=12.27% VoiSS scores Physical=25.23% Activity limitation=19.64 Emotional=6.84%	Physical subscale of the VoiSS showed elevated scores.
Rodica-Elena (2017)	Evaluate accuracy of SVHI and SVHI-10 in predicting vocal health and identifying vocal problems in professional singers.	Likert scale 0-4 (never to always)	1. SVHI 2. SVHI-10	General questionnaire focusing on health history, prevalence of smoking and drinking, vocal abuse and singing experience.	Descriptive statistics	NA	1. SVHI scores of singing students a. Mean: 17.81 b. Min-Max score: 9-45 2. SVHI-10 scores of singing students a. Mean: 5.93 b. Min-Max scores: 1-12	1. SVHI scores are as expected for healthy singers.
Ropero (2018)	Evaluate specific outcomes of vocal pedagogy, voice therapy or phonomicrosurgery in singers with	Likert scale 0-4 (never to always)	1. VHI 2. SVHI	NA	Descriptive statistics were calculated for all vocal function parameters before and 3 months after intervention, as well as their changes	NA	1. Patients' subjective self-assessment of their own voice= mild to moderate impairment a. VHI=11 ± 8 b. SVHI=70 ± 29	Elevated SVHI scores were reported by singers

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	various functional and organic voice problems							
Rosen (2000)	Study the VHI in singers with voice disorders compared to non-singers with voice disorders.	Likert scale 0-4 (never to always)	VHI	NA	Descriptive statistics	NA	1. Total VHI score for classical singers=29.8 2. Total VHI score for non-singers=53.2	1. Classical singers had lower VHI scores than non- singers.
Ryan (2009)	Investigate the perceived effects of the female hormonal cycle on young female classical singers	VAS 10-cm VAS with anchors strongly agree to strongly disagree	NA	1. Questionnaire focusing on vocal quality 2. Daily diary focusing on physical symptoms, mood states, hormonal contraception and other symptoms such as intercurrent illness, unrelated physical	Statistical analysis 1. Descriptive analysis to compute voice quality measures 2. Linear mixed models were used to measure the independent effects of cycle (days 24–4 compared with days 5–23), gender, and contraceptive pill use on voice quality.	I. Marginal Mean Values for Voice Quality in Males and Females 1. Gender effect A. Peak form mean- (SE) a. Males: 6.8 (0.3) b. Females: 5.4 (0.2) c. p value=<0.0001 B. Weak- mean (SE) a. Males: 7.0 (0.4) b. Females: 6.2 (0.2) c. Difference (CI): 0.8 (-0.1, 1.6) C. Sluggish-mean (SE) a. Males: 7.0 (0.4) b. Females: 6.2 (0.2) c. Difference (CI): 0.8 (-0.1, 1.6)	NA	1. There was a significant difference in 'peak form' and marginal significance in 'weak and sluggish voice' between males and females. 2. Voice quality was significantly low during days 24-4 compared to days 5-23

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
				symptoms, body pain and alcohol intake		p value for weak and sluggish voice=0.07 2. Cycle effect A. Fatigued- mean (SE) c. p value=0.004 B: Effort-Mean (SE) c. p value=0.03		
Schlonegger (2011)	Document graduate voice students' voice use before, during, and after an intense week of opera rehearsals	Likert scale 1. Non validated 1-7 (strongly disagree to strongly agree) 2. Validated 0-4 (never to always)	1. SVHI	Info regarding voice care, indicators of perceived vocal stress	1. Descriptive statistics-range	1. I am doing a good job taking care of my voice today: a. Mean score during baseline period=Case 1: 5.0; Case 2: 6.75 2. Overall scores a. Pre-baseline days= Case 1: 2.22; Case 2: 1.50 3. Today, my voice feels tired a. Intensive week=Case 1: 3.6; Case 2: 5.6 b. Postbaseline days=Case 1: 7; Case 2: 3	1. Case 1 a. SVHI range: 5.6-7.6 2. 2. Case 2 a. SVHI range: 2.1-2.8	Both singers remained vocally healthy, throughout the opera production/study periods
Sapir (1993)	Survey the symptoms of vocal attrition (reduction in vocal function due to behavioural, biological l or	NR	NA	Info regarding symptoms of vocal attrition and possible factors contributing to it	Descriptive statistics	I. Prevalence of symptoms 1. Free of symptoms: n=10 (13%) 2. Few (one or two) n=19 (26%) 3. Multiple (three or more) symptoms: n=45 (61%) II. Frequency of symptoms	NA	1. Vocal attrition is prevalent among voice students. 2. A quarter of the students

Study name	Objectives	Response scale	Validated voice measures	Questionnaire developed by authors	Statistical analysis	Self-reported voice problems-non-validated measures	Self-reported voice problems-validated measures	Key conclusions
	psychosomatic factors) and possible factors contributing to it					1. Dryness of the throat: (81%) 2. Throat tightness: (66%) 3. Vocal fatigue (64%) 4. Throat discomfort (58%) 5. Hoarseness (48%) 6. Reduced pitch range (36%) 7. Pain in the throat (19%)		indicated that they experience problems or changes in their voice prior to or during menstruation
Vermulen (2020)	Describe the effect of superficial hydration and systemic hydration, on voice quality in future female professional singers	Likert	Voice Fatigue Index (VFI)	Questionnaire focussing on demographics, singing related information and vocal symptoms	Descriptive statistics (Mean and SD)	87.5% (n = 21) reported a negative change in their voices after rehearsals 1. breathiness (n = 6) 2. Painful voice production (n = 2) 3. Grade of voice disorder (n = 12) 4. Roughness (n = 5) 5. Loss of voice (n = 3) 6. Generally softer voice (n = 7) 7. Weaker voice on certain pitch levels (n = 5).	VFI: Mean (SD) Factor 1=Tiredness of voice: 21.83 (9.13) Factor 2=7.5 (4.49) Factor 3=9.62 (1.68)	Use of superficial hydration resulted in positive outcomes of perceptual parameters of voice quality and symptoms of vocal fatigue in future female professional singers.

Table 2.5: SVHI: Singing Voice Handicap Index; SVHI-10: Singing Voice Handicap Index-10; VHI: Voice Handicap Index; VoiSS: Voice Symtom Scale; CSHI: Classical Singing Handicap Index; V-DOP: Voice Disorder Outcome Profile; EASE: Evaluation of Ability to Sinh Easily; VAS: Visual Analogue Scale; SD: Standard Deviation; NA: Not Applicable; NR: Not Reported; VC: Vocal complaints

Appendix 3.1- Search strategy for systematic review on voice-related coping in professional voice users for each database

MEDLINE COMPLETE

1. (MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Dysphonia") OR (MH "Aphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngeal Edema") OR (MH "Laryngitis") OR (MH "Granuloma, Laryngeal")
2. (voice OR vocal)n5(problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
3. 1 OR 2
4. (MH "Emotional Adjustment") OR (MH "Adaptation, Psychological") OR (MH "Attitude") OR (MH "Health Knowledge, Attitudes, Practice") OR (MH "Attitude to Health") OR (MH "Self-Management") OR (MH "Social Support") OR (MH "Information Seeking Behavior")
5. (coping)N2(skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
8. 3 AND 6 AND 7

ACADEMIC SEARCH COMPLETE

1. (((((DE "VOICE disorders" OR DE "LARYNGEAL diseases" OR DE "HOARSENESS" OR DE "MUSCLE tension dysphonia" OR DE "VOCAL cord injuries") OR (DE "APHONIA")) OR (DE "LARYNGITIS" OR DE "LARYNGEAL edema")) OR (DE "VOICE change")) OR (DE "VOCAL fold nodules")
2. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
3. 1 OR 2
4. (((DE "ADAPTATION level (Psychology)" OR DE "ADAPTABILITY (Psychology)" OR DE "ADJUSTMENT (Psychology)") OR (DE "LIFE skills" OR DE "SELF-management (Psychology)")) OR (DE "AVOIDANCE (Psychology)"))

5. (coping) adj2 (skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
8. 3 AND 6 AND 7

CINAHL COMPLETE

1. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
2. (MH "Voice Disorders") OR (MH "Dysphonia, Muscle Tension") OR (MH "Laryngeal Diseases") OR (MH "Laryngeal Edema") OR (MH "Laryngitis") OR (MH "Aphonia") OR (MH "Hoarseness") OR (MH "Phonotrauma") OR (MH "Vocal Cord Hemorrhage")
3. (voice OR vocal)N5(problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
4. 2 OR 3
5. (MH "Attitude to Illness") OR (MH "Adaptation, Psychological") OR (MH "Self-Management") OR (MH "Avoidance (Psychology)") OR (MH "Coping") OR (MH "Symptom Distress") OR (MH "Help Seeking Behavior") OR (MH "Information Seeking Behavior")
6. (coping) adj2 (skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
7. 5 OR 6
8. 1 AND 4 AND 7

PSYCINFO

1. MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Aphonia") OR (MH "Dysphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngitis")
2. (voice OR vocal)N5(problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
3. 1 OR 2
4. (((((DE "Adjustment" OR DE "Emotional Adjustment" OR DE "Adaptability (Personality)" OR DE "Adaptive Behavior") OR (DE "Avoidance" OR DE "Behavior")) OR (DE "Stress and Coping Measures" OR DE "Coping Behavior")) OR (DE "Help Seeking Behavior" OR DE "Health Care Seeking Behavior" OR DE "Information Seeking")) OR (DE "Social Support")) OR (DE "Health Attitudes")
5. (coping)N2(skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
8. 3 AND 6 AND 7

AMED

1. "Voice Disorders" OR Dysphonia OR laryngeal disease
2. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
3. 1 OR 2
4. Adaptation, Psychological OR attitude OR social support
5. (coping) adj2 (skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher

OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer

8. 3 AND 6 AND 7

EMBASE

1. MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Aphonia") OR (MH "Dysphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngitis")
2. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
3. 1 OR 2
4. Adaptation, Psychological
5. (coping) adj2 (skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
8. 3 AND 6 AND 7

MUSIC PERIODICALS

1. MH "Voice Disorders") OR (MH "Laryngeal Diseases") OR (MH "Hoarseness") OR (MH "Aphonia") OR (MH "Dysphonia") OR (MH "Laryngopharyngeal Reflux") OR (MH "Laryngitis")
2. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni*
3. 1 OR 2
4. (MH "Adaptation, Psychological") OR (MH "Emotional Adjustment") OR (MH "Attitude") OR (MH "Self-Management")

5. (coping) adj2 (skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
8. 3 AND 6 AND 7

COMMUNICATION SOURCE COMPLETE

1. (DE "VOICE disorders" OR DE "LARYNGEAL diseases") OR (DE "VOCAL fold nodules")
2. (voice OR vocal) adj5 (problem* OR disorder* OR symptom* OR change* OR injur* OR disturbance OR hoarse* OR fatigue) OR aphoni* OR dysphoni* OR hoarse*
3. 1 OR 2
4. (MH "Attitude")
5. (coping)N2(skill* OR behavio#r OR style* OR strateg*) OR Cope OR Adjust* OR Adapt* OR coping OR avoid* OR "information seeking" OR "social support"
6. 4 OR 5
7. singer OR vocalist OR (vocal OR singing)N2(coach OR teacher OR performer) OR tenor* OR sopran* OR choir* OR bass* OR opera OR operatic OR bariton* OR mezzo-soprano OR jazz OR gospel OR canto OR carnatic OR hindustani OR folk OR teacher OR lawyer OR priest OR preacher OR telemarket* OR “call centre” OR sales OR educator OR tutor OR vendor OR attorney OR lecturer OR actor OR presenter OR doctor OR therapist OR receptionist OR professor OR “radio jockey” OR businessman OR announcer
8. 3 AND 6 AND 7

GREY LITERATURE SOURCES

OPENGREY AND BASE

Voice (problem* OR disorder*) OR vocal (problem OR disorder OR symptom*) AND coping OR cope

Appendix 3.2: Table with excluded studies from the systematic review on coping and reasons for exclusion

Study name	Study title	Reason for exclusion
Achey (2016)	Vocal Hygiene Habits and Vocal Handicap Among Conservatory Students of Classical Singing	Did not study voice-related coping
Albustan (2018)	Kuwaiti Teachers' Perceptions of Voice Handicap	Did not study voice related coping
Alva (2017)	Study of risk factors for development of voice disorders and its impact on the quality of life of school teachers in Mangalore, India	Did not use valid tool to measure coping
Braun-Janzen (2009)	Singers' interest and knowledge levels of vocal function and dysfunction: survey findings	Did not use valid tool to measure coping
De Alvear (2009)	Teachers' voice disorders collateral effects	Did not use valid tool to measure coping
De Alvear (2009)	An interdisciplinary approach to teachers' voice disorders and psychosocial working conditions	Did not use valid tool to measure coping
De Jong (2010)	An introduction to the teacher's voice in a biopsychosocial perspective	Publication type-opinion piece
Gilman (2009)	Performer's attitudes toward seeking health care for voice issues: understanding the barriers	Did not use valid tool to measure coping
Gunjawate (2016)	Exploring Attitudes of Indian Classical Singers Toward Seeking Vocal Health Care	Did not use valid tool to measure coping
Kilk-Salupere (2012)	Voice teachers' strategies to cope with the performance situation	Did not study voice related coping
Basem (2014)	Jordanian teachers' perceptions of voice handicap	Did not study voice related coping
Medeiros (2016)	Voice disorders: social representations by teachers in speech therapy ;	Did not use valid tool to measure coping
Medeiros (2019)	Work absenteeism due to voice disorders in Brazilian schoolteachers	Did not use valid tool to measure coping
Nallamuthu (2011)	A survey of voice related concerns in elderly college teachers	Did not use valid tool to measure coping
Petty (2012)	Health information-seeking behaviors among classically trained singers	Did not use valid tool to measure coping
Sandgren (2002)	Voice, soma, and psyche: a qualitative and quantitative study of opera singers	Did not study voice related coping

Study name	Study title	Reason for exclusion
Sapir (1993)	Vocal attrition in voice students: Survey findings	Did not use valid tool to measure coping
Sapir (1996)	Singers' and non-singers' vocal health, vocal behaviours, and attitudes towards voice and singing: indirect findings from a questionnaire	Did not use valid tool to measure coping
Sathyanarayanan (2019)	Vocal Health Practices Among School Teachers: A Study From Chennai, India	Did not use valid tool to measure coping
Sielska-Badurek (2017)	Singers' Vocal Function Knowledge Levels, Sensorimotor Self-awareness of Vocal Tract, and Impact of Functional Voice Rehabilitation on the Vocal Function Knowledge and Self-awareness of Vocal Tract	Did not use valid tool to measure coping
Van Houtte (2011)	The impact of voice disorders among teachers: vocal complaints, treatment-seeking behavior, knowledge of vocal care, and voice-related absenteeism	Did not use valid tool to measure coping
Van Opstal (2010)	A systematic, holistic and integrative process of self-control for voicing with optimal coping effects in teachers. 2. A process of change--an expert's opinion	Publication type-opinion piece

Appendix 4.1: COREQ (COnsolidated criteria for REporting Qualitative Research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	170
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	170
Occupation	3	What was their occupation at the time of the study?	170
Gender	4	Was the researcher male or female?	170
Experience and training	5	What experience or training did the researcher have?	170
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	173
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	173, Appendix 4.1
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	170
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	175,176
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	172
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	172
Sample size	12	How many participants were in the study?	171,178

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Non-participation	13	How many people refused to participate or dropped out? Reasons?	177
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	174
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	NR
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	177,178
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	NR
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NR
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	174
Field notes	20	Were field notes made during and/or after the inter view or focus group?	174
Duration	21	What was the duration of the inter views or focus group?	174
Data saturation	22	Was data saturation discussed?	NR
Transcripts returned	23	Were transcripts returned to participants for comment and/or	176

Appendix 4.2- Ethics application documents for qualitative study

ETHICS APPLICATION

Ethics ETH1920-0100: Aparna Ramachandran (Low risk)

Date	19 Aug 2019
Researcher	Aparna Ramachandran
Project	Self-reported voice problems and coping strategies in Western Classical and Carnatic singers: An exploratory study of perceptions among singers, Vocal Coaches and Speech and language therapists
School	School of Health Sciences
Department	Division of Nursing

Risks

R1) Does the project have funding?

Yes

R2) Does the project involve human participants?

Yes

R3) Will the researcher be located outside of the UK during the conduct of the research?

No

R4) Will any part of the project be carried out under the auspices of an external organisation, involve collaboration between institutions, or involve data collection at an external organisation?

No

R5) Does your project involve access to, or use of, material that could be classified as security sensitive?

No

R6) Does the project involve the use of live animals?

No

R7) Does the project involve the use of animal tissue?

No

R8) Does the project involve accessing obscene materials?

No

R9) Does the project involve access to confidential business data (e.g. commercially sensitive data, trade secrets, minutes of internal meetings)?

No

R10) Does the project involve access to personal data (e.g. personnel or student records) not in the public domain?

No

R11) Does the project involve deviation from standard or routine clinical practice, outside of current guidelines?

No

R12) Will the project involve the potential for adverse impact on employment, social or financial standing?

No

R13) Will the project involve the potential for psychological distress, anxiety, humiliation or pain greater than that of normal life for the participant?

No

R15) Will the project involve research into illegal or criminal activity where there is a risk that the researcher will be placed in physical danger or in legal jeopardy?

No

R16) Will the project specifically recruit individuals who may be involved in illegal or criminal activity?

No

R17) Will the project involve engaging individuals who may be involved in terrorism, radicalisation, extremism or violent activity and other activity that falls within the CounterTerrorism and Security Act (2015)?

No

Applicant & research team

T1) Principal Applicant

Name

Aparna Ramachandran

T2) Co-Applicant(s) at City

T3) External Co-Applicant(s)

T4) Supervisor(s)

Dr Shashi Hirani

Prof Katerina Hilari

T5) Do any of the investigators have direct personal involvement in the organisations sponsoring or funding the research that may give rise to a possible conflict of interest?

No

T6) Will any of the investigators receive any personal benefits or incentives, including payment above normal salary, from undertaking the research or from the results of the research above those normally associated with scholarly activity?

No

T7) List anyone else involved in the project.

Project details

P1) Project title

Self-reported voice problems and coping strategies in Western Classical and Carnatic singers: An exploratory study of perceptions among singers, vocal coaches and speech and language therapists

P1.1) Short project title

Voice problems and coping skills in singers

P2) Provide a lay summary of the background and aims of the research, including the research questions (max 400 words).

Self-reported voice problems are common in singers due to intense practice regimes, repeated performances, environmental conditions during performance and stressful lifestyle. They range from subtle transient changes to more serious and clinically measurable issues. While various selfassessment tools have been introduced for clinical assessment, they are not sensitive enough to detect and measure minor vocal symptoms which are detrimental to a singer's career and performance. Qualitatively studying perceptions of singers and related professionals such as vocal coaches (VC) and speech and language therapists (SLT) can provide a multidisciplinary understanding of voice problems in singers. While SLT can help identify any shortcomings and improve the sensitivity of current assessment methods from a clinical perspective, VC can provide information about voice problems in singers from an artistic perspective. Additionally, singers can provide first-hand perceptions, particularly on the subtle but significant vocal changes which may be inconsequential for a non-singer. Comparing views between Western classical singers and Carnatic singers (South Indian classical music) and professionals involved in maintaining their vocal health would expand insights on how culture influences perception and management of voice problems.

To manage voice problems, singers adopt various coping styles which can have significant clinical, behavioural, psychosocial and vocational implications on the voice. Despite its significance on vocal performance and subsequently on quality of life, voice-related coping has seldom been studied in singers. Additionally, a cross-cultural comparison can ascertain the role of culture in coping and facilitate mutual learning.

Information from singers, SLT and VC can be beneficial in devising appropriate assessment protocols sensitive to identify concerns specific to singers and more effective rehabilitation. Given the current low levels of research in the area, qualitatively studying the views on coping strategies used by singers will facilitate better understanding of assessment of voice-related coping and its relevance in maintaining vocal health

AIMS:

1. Identify voice problems and causal factors in Western Classical and Carnatic singers and compare symptom profile across genre groups
2. Determine attributes of normal and abnormal voice as perceived by singers, VC and SLT and explore perceptual differences between groups

3. Recognise any cultural themes which may emerge by comparing perceptions of singers, SLT and VC associated with both genres.
4. Explore adaptive and maladaptive voice-related coping strategies identified by singers, VC and SLT
5. Identify self-assessment tools currently used by SLT
6. Understand perceptions of singers and VC regarding available health care resources for addressing voice problems.

P4) Provide a summary and brief explanation of the research design, method, and data analysis.

METHODS:

Design:

A qualitative analytic methodology will be adopted owing to the complexity, diversity and nuanced nature (Holloway and Todres, 2003) of this context, which would favour the subject matter of the current study. Qualitative research undertakes a multifaceted approach which is suitable to study culture, society and behaviour by analysing and synthesising people's words and actions (Hogan, Dolan and Donnelley, 2009). Qualitative research is concerned with aspects of reality that cannot be quantified (Queiros, Faria & Almeida, 2017) and pays attention to the quality of experiences of subject groups which typically goes unidentified in quantitative research. Therefore, a qualitative approach would potentially capture in-depth information on voice problems and associated voice related coping in singers from a multi-dimensional perspective.

For the present study, responses will be elicited via semi-structured qualitative interviews carried out by the researcher. Elicited data will be analysed using thematic analysis approach (Braun & Clarke, 2006) to explore emerging themes. Steps described by Braun and Clarke (2006) will be followed which is detailed under data analysis. Convenience sampling methodology will be adopted along with principles of snowball sampling for recruitment of participants.

Participants:

Sampling:

Initially 18 participants representing the singing and the professional community will be selected for the study using convenience sampling methods. Purposive sampling has been chosen to provide a true

representation of the target population thereby enabling exploration of relevant experiences and phenomena of interest. The sample size has been determined using guidelines proposed by Francis et al (2010) which states that the initial analysis sample should contain at least 10 interviews. Owing to the wide range of characteristics of the participants being sought, 3 participants will be recruited per group which leads to 18 participants in total. Following this, 3 further interviews will be conducted and when three consecutive interviews generate no new themes, then this point is defined as data saturation. A maximum of 24 participants will be interviewed after which data collection will be terminated even if data saturation is not attained.

To improve representativeness of the sample, singers who don't speak English, but are fluent in regional languages such as Tamil, Malayalam, Hindi and Kannada will be considered for the study, since the researcher is fluent in the aforementioned languages.

Distribution:

The participants will be chosen to represent the following groups (3 participants per group):

1. Western Classical singers
2. Carnatic singers
3. Western Classical vocal coaches
4. Carnatic vocal coaches
5. Speech and language therapists specialised in managing voice disorders in Western classical singers.
6. Speech and language therapists specialised in managing voice disorders in Carnatic singers.

Inclusion/Exclusion criteria:

Speech and language therapists and vocal coaches with a minimum of 3 years of experience working with singers will be chosen to participate in the study.

Full time or part-time Western classical and Carnatic singers with relevant professional singing experience in their specialism will be recruited for the study.

All participants will be over 18 years of age and no gender or cultural limitations are placed.

Recruitment

Singers and vocal coaches:

Classical singers based in the UK will first be recruited using professional connections of the researcher. More participants will be recruited using snowball sampling methods.

The researcher will also make use of contacts in India through her music tutor(s) to recruit Carnatic singers and vocal coaches should enough participants be unavailable in the UK, to meet required numbers and 'saturation' per groups identified above. These participants will be interviewed via telephone/video calls. Participants will be recruited on a first asked, first recruited basis.

Speech and Language therapists:

The British Voice Association will be contacted to recruit Speech and Language therapists specialised in singers' voices. The alma mater of the researcher will be contacted to recruit potential Speech and Language therapists specialised in working with Carnatic singers.

Additionally, the study will also be advertised for recruitment in Social Media (e.g. Twitter) through the research team's and research centres' handles.

Interviews:

Each participant will have a semi-structured interview with the researcher which would last approximately 45 minutes to 1 hour. Demographic and singing related details such as experience, genre, training will be elicited prior to the main interview questions. The interview questions will vary across the participant groups since the focus of the information to be elicited from each group is different. A set of probes will accompany the open-ended questions to elicit relevant and study specific responses.

Speech and language therapists and vocal coaches will be interviewed first. Based on the responses of these interviews, the interview questions for singers may be adapted (e.g. prompt on specific symptoms or strategies used) to ensure that the interview will generate the most relevant information from the singers.

The obtained data will also be utilised to develop the assessment protocol for a subsequent quantitative study. The quantitative study aims to identify, analyse and compare the self-reported voice problems and coping strategies in Western Classical and Carnatic singers. Additionally, the study will explore the association between self-reported voice problems and coping strategies in the two groups of singers. At the end of the qualitative study, the elements to be included in the assessment protocol for the quantitative study will be identified. A separate ethics application will be submitted for the quantitative study following completion of the present study.

Data Analysis:

To suit the qualitative nature of the study, a thematic analysis will be used to explore the perception of self-reported voice problems and coping strategies in singers. Thematic analysis identifies, analyses and depicts patterns within data and describes it in detail while offering an accessible and theoretically flexible approach to analysing qualitative data (Braun & Clarke, 2006). Creating themes relevant to understanding self-reported voice problems and voice related coping in singers, which could potentially contribute into the quantitative study to be followed justifies the selection of using thematic analysis. The generated themes would belong to two primary domains -self-reported voice problems and coping in singers. Some of the themes generated could be physical descriptions of vocal discomfort (tickling, burning), risk factors (singing while unwell, environmental factors such as poor acoustics and air quality), self-help strategies (over the counter medications, voice rest) etc.

A 'contextualist' approach will be adopted, which acts as a middle ground between the essentialist or realist method and the constructionist method. This will enable the researcher to explore the experiences of the participants without losing the realistic element, at the same time, not losing focus on the data collected (Braun & Clarke, 2006). Since a systematic review has already been performed in the study subject, certain themes have already been anticipated. As the results of this study will be utilised in devising the methodology of a quantitative study, a theoretical thematic analysis would be deemed more suitable, as relevant aspects of the data collected can be analysed in depth and reported elaborately. Themes will be identified at a latent or interpretative level, so that the data can be theorised, and underlying ideas and conceptualisations can be examined. (Braun and Clarke, 2006).

The steps described by Braun and Clarke (2006) to conduct thematic analysis will be followed. The researcher will familiarise herself with the data by re-reading the contents multiple times while taking down notes and ideas for coding. An orthographic script will be prepared by transcribing all the data, verbatim. The transcripts will be checked with the audio recordings for accuracy. Following this, relevant data will be identified, and primary codes will be generated. Examples of data extracts will be attached to the generated codes. These codes will be analysed to generate 'themes' which is a general idea formed by collating various codes based on a common factor. If there are codes which do not belong to any other theme, they will be temporarily stored under a theme called 'other'. A thematic map will be drawn, showing all the main themes and sub themes within them. The generated themes will be reviewed to ensure that there is adequate 'internal homogeneity' and 'external heterogeneity'. The themes will then be defined and given appropriate names and a logical coherent description will be reported.

Once all the themes have been identified, inter group comparisons will be undertaken to explore any relevant representations based on factors such as culture, backgrounds (artistic or health) etc. Sub group analyses will also be undertaken to identify emerging patterns related to demographic factors such as gender, experience etc.

P4.1) If relevant, please upload your research protocol.

P5) What do you consider are the ethical issues associated with conducting this research and how do you propose to address them?

1. Time commitment risks may occur since the participants are working professionals. This will be mitigated by keeping the interview as short as possible and efficiently using the probe questions to elicit relevant information. Participants will also be given the choice to split the interview over multiple sessions should they not be comfortable to commit to an hour.

2. The researcher shall not, under any circumstance provide any clinical or non-clinical advice to any of the participants, even when asked by the participants themselves. Should the participants reveal any medical concerns, both physical and psychological, then they will be asked to visit a GP to get their concerns addressed.

3. Since a lot of confidential information will be revealed and recorded during data collection interviews, significant measures will be taken to ensure data protection. All hard copies of data will be stored in a locked drawer in City, University of London and will be in the possession of the researcher until publication of results. Following this, the data will be transferred to the archives within the university and stored for 10 years, after which it will be destroyed.

Soft copies will be stored in password protected computers and secure servers of the university which can be accessed only by the researcher or supervisors. Data transfer will be done via encrypted keys or encrypted before emailing (via 7zip or VeraCrypt software). No personal details will be included in the audio recording of interviews and recordings will be immediately transferred to an encrypted device at the end of the interview to ensure data protection.

4. During the course of the interview, should any of the participants reveal any illicit or criminal malpractices or acts they have committed, this information will be passed on to the supervisors who will use their discretion to deal with the issue.

P6) Project start date

The start date will be the date of approval.

P7) Anticipated project end date

01 Dec 2020

P8) Where will the research take place?

1. City, University of London
2. Home office of the researcher

P10) Is this application or any part of this research project being submitted to another ethics committee, or has it previously been submitted to an ethics committee? No

Funding

F1) Funder

City, University of London (PhD Studentship)

F2) Does the funder require external membership on the approving REC?

No

F3) Has the funding been approved? Yes

F4) Value of grant £ 60000

Human participants: information and participation

The options for the following question are one or more of:

'Under 18'; 'Adults at risk'; 'Individuals aged 16 and over potentially without the capacity to consent'; 'None of the above'.

H1) Will persons from any of the following groups be participating in the project?

None of the above

H2) How many participants will be recruited?

24

H3) Explain how the sample size has been determined.

The sample size has been determined using guidelines proposed by Francis et al (2010) which states that the initial analysis sample should contain at least 10 interviews. Owing to the wide range of characteristics of the participants being sought, 3 participants will be recruited per group which leads to 18 participants in total. Following this, 3 further interviews will be conducted and when three consecutive interviews generate no new themes, then this point is defined as data saturation. A maximum of 24 participants will be interviewed after which data collection will be terminated even if data saturation is not attained.

H4) What is the age group of the participants?

Lower

18

H5) Please specify inclusion and exclusion criteria.

Speech and language therapists and vocal coaches with a minimum of 3 years of experience working with singers will be chosen to participate in the study.

Full time or part-time Western classical and Carnatic singers with relevant professional singing experience in their specialism will be recruited for the study.

All participants will be over 18 years of age and no gender or cultural limitations are placed.

To improve representativeness of the sample, singers who don't speak English, but are fluent in regional languages such as Tamil, Malayalam, Hindi and Kannada will be considered for the study, since the researcher is fluent in the aforementioned languages.

H6) What are the potential risks and burdens for research participants and how will you minimise them?

1. Due to the time consuming nature of the interview which could last up to an hour, participants will be given the option to take breaks when required. The interview will also be terminated, should the participant wish to do so and rescheduled to a later date, if possible.
2. No emotional or psychological distress is likely during the interview, however, should any participant feel any psychological discomfort, breaks will be offered or the interview will be postponed to a later date should the participant indicate so.

3. The methodology has been formulated to adhere to the principles, rights and obligations of the GDPR, tailored by the Data Protection Act 2018 to reduce any risks associated with data collection and analysis.

H7) Will you specifically recruit pregnant women, women in labour, or women who have had a recent stillbirth or miscarriage (within the last 12 months)?

No

H8) Will you directly recruit any staff and/or students at City?

None of the above

H8.1) If you intend to contact staff/students directly for recruitment purpose, please upload a letter of approval from the respective School(s)/Department(s).

H9) How are participants to be identified, approached and recruited, and by whom?

Singers and vocal coaches:

Singers will first be recruited using professional connections of the researcher. These will be Classical singers based in the UK. More participants will be recruited using snowball sampling methods.

The researcher will also make use of contacts in India through her music tutor(s) to recruit Carnatic singers and vocal coaches should enough participants be unavailable in the UK, to meet required numbers and 'saturation' per groups identified above. These participants will be interviewed via telephone/video calls. Participants will be recruited on a first asked, first recruited basis.

Speech and Language therapists:

The British Voice Association will be contacted to recruit Speech and Language therapists specialised in singers' voices. The alma mater of the researcher will be contacted to recruit potential Speech and Language therapists specialised in handling Carnatic singers.

H10) Please upload your participant information sheets and consent form, or if they are online (e.g. on Qualtrics) paste the link below.

H11) If appropriate, please upload a copy of the advertisement, including recruitment emails, flyers or letter.

H12) Describe the procedure that will be used when seeking and obtaining consent, including when consent will be obtained.

Written consent will be obtained from all willing participants before commencement of the interviews by the researcher. A participant information sheet will be provided to all participants illustrating the purpose, data collection process and the nature of the content of the data which will be extracted. Potential participants will also be explained that they have the option to withdraw participation from the study at any given point of time till commencement of transcription, without providing an explanation for their decision. Invitee will be given 24 hours to consider before taking part. This will be done by sending the information booklet in advance via email or post. The signed consent form will be collected on the day of the interview prior to commencement. For participants undergoing interviews via skype, scanned copied of the signed consent forms will be requested prior to commencement of the interview. Additionally, a verbal consent will be obtained at the start of the interview for all participants.

H13) Are there any pressures that may make it difficult for participants to refuse to take part in the project?

No

H14) Is any part of the research being conducted with participants outside the UK? Yes

Human participants: method

The options for the following question are one or more of:

'Invasive procedures (for example medical or surgical)'; 'Intrusive procedures (for example psychological or social)'; 'Potentially harmful procedures of any kind'; 'Drugs, placebos, or other substances administered to participants'; 'None of the above'.

M1) Will any of the following methods be involved in the project:

None of the above

M2) Does the project involve any deceptive research practices?

No

M3) Is there a possibility for over-research of participants?

No

M4) Please upload copies of any questionnaires, topic guides for interviews or focus groups, or equivalent research materials.

M5) Will participants be provided with the findings or outcomes of the project?

Yes

M5.1) Explain how this information will be provided.

All participants will be provided written/verbal feedback to study participants on implications of the study results and how it impacts our current understanding of the singing voice. The summaries provided, particularly to singers and vocal coaches would be using lay terminology.

M6) If the research is intended to benefit the participants, third parties or the local community, please give details.

1. Information gathered from singers and vocal coaches will be beneficial to understand the unique vocal problems of singers and its impact on their well-being. This will benefit other singers with voice problems.
2. Exploring the views of Speech and language therapists will help draw insights about voice problems and coping in singers and provide an opportunity to identify gaps in the assessment and rehabilitation of singers' voices.

M7) Are you offering any incentives for participating?

No

M8) Does the research involve clinical trial or clinical intervention testing that does not require Health Research Authority or MHRA approval? No

M9) Will the project involve the collection of human tissue or other biological samples that does not fall under the Human Tissue Act (2004) that does not require Health Research Authority Research Ethics Service approval? No

M10) Will the project involve potentially sensitive topics, such as participants' sexual behaviour, their legal or political behaviour, their experience of violence?

No

M11) Will the project involve activities that may lead to 'labelling' either by the researcher (e.g. categorisation) or by the participant (e.g. 'I'm stupid', 'I'm not normal')?

No

Data

D1) Indicate which of the following you will be using to collect your data.

Interviews

Audio/digital recording interviewees or events

D2) How will the the privacy of the participants be protected?

De-identified samples or data

D3) Will the research involve use of direct quotes?

Yes

D5) Where/how do you intend to store your data?

Data to be kept in a locked filing cabinet

Data and identifiers to be kept in separate, locked filing cabinets

Storage on encrypted device (e.g. laptop, hard drive, USB

Storage at City

D6) Will personal data collected be shared with other organisations?

No

D7) Will the data be accessed by people other than the named researcher, supervisors or examiners? No

D8) Is the data intended or required (e.g. by funding body) to be published for reuse or to be shared as part of longitudinal research or a different/wider research project now or in the future? No

D10) How long are you intending to keep the research data generated by the study?

Data will be stored for 10 years

D11) How long will personal data be stored or accessed after the study has ended?

Identifiable data (with the exception of consent forms) will be destroyed soon after study closure; consent forms and the research data will be transferred to the archives within the university and stored for 10 years, after which it will be destroyed.

D12) How are you intending to destroy the personal data after this period?

All hard copies will be shredded before they are discarded. All digital files will be virtually shredded using a standard digital file shredding algorithm.

Health & safety

HS1) Are there any health and safety risks to the researchers over and above that of their normal working life? No

HS3) Are there hazards associated with undertaking this project where a formal risk assessment would be required?

No

City, University of London
School of Health Sciences
Northampton Street
London EC1V 0HB
United Kingdom

CONSENT FORM FOR QUALITATIVE STUDY

REC reference number: ETH1920-0100

Name of researcher: Aparna Ramachandran

Version number: 3

Date: 29.11.19

Title of study: Voice problems and coping strategies in Western Classical and Carnatic singers: Exploring Perceptions of Singers, Speech & Language Therapists and vocal coaches.

		Please initial box
1	I confirm that I have read and understood the participant information dated 29.11.2019 and version number 3 for the above study. I have had the opportunity to consider the information and ask questions which have been answered satisfactorily.	
2.	I understand that my participation is voluntary and that I am free to withdraw without giving a reason without being penalised or disadvantaged.	
3.	I understand that I will be able to withdraw my data up to the time of transcription	
4.	I allow the researcher to take notes during the interview and agree to the interview being audio recorded.	
5.	I understand that the audio recording made of this interview will be used only for analysis in this study and that extracts from the interview, from which I would not be personally identified, may be used in any conference presentation, report or journal article developed as a result of the research.	
8.	I agree to my responses being used as direct quotes in the study, if necessary	
6.	I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure.	
7.	I agree to City recording and processing this information about me. I understand that this information will be used only for the purpose(s) explained in the participant information and my consent is conditional on City complying with its duties and obligations under the General Data Protection Regulation (GDPR).	
9.	I would like to be informed of the results of this study once it has been completed and understand that my contact details will be retained for this purpose.	
10.	I agree to take part in the above study.	

_____	_____	_____
Name of Participant	Signature	Date
_____	_____	_____
Name of Researcher	Signature	Date

PARTICIPANT INFORMATION SHEET FOR QUALITATIVE STUDY

DATE: 29.11.19

REC: ETH1920-0100

VERSION-3

PRINCIPAL INVESTIGATOR-APARNA RAMACHANDRAN

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. You will be given a copy of this information sheet to keep.

What is the purpose of this study?

This study is being undertaken as part of a PhD research project within the School of Health Sciences at City, University of London. This project aims to explore perceptions of singers, speech and language therapists and vocal coaches about voice problems and coping strategies commonly seen in singers.

Why have I been invited to take part?

You have been invited to take part in this study because you fall under one of the following groups, thus have experiences relevant to the aims of the study:

Western Classical singer, Carnatic singer, Western classical vocal coach, Carnatic vocal coach, speech and language therapists working with Western classical singers or speech and language therapists working with Carnatic singers.

18 participants (3 participants per group) will initially be recruited which may go up to 24 participants depending on whether the needs of the study have been met.

Do I have to take part?

Participation in this interview is voluntary, and you can choose not to participate in part or the entire study, should you wish to do so. You have the right to withdraw at any stage of the study without being penalised or disadvantaged in any way. It is up to you to decide whether or not to take part. If you do decide to participate, you are still given the option to withdraw from the study at any stage and without giving a reason.

What will happen if I take part?

You will be involved for the duration of the time it takes to complete the interview. The interview is aimed to understand your perceptions regarding all aspects of voice problems seen in singers. The interviews will be audio recorded and you will be requested to sign a consent form granting permission for recording and use of the data for the purpose of the study. We will then analyse the data for publication in a final report. The research study will go on until July 2020.

What do I have to do?

If you agree to take part in the study, the researcher will contact you to ask about your availability and to confirm the interview. A face to face/skype/phone interview can be arranged and the interview will take roughly 60 minutes. First, you will be asked some questions about yourself (e.g. age, gender, professional experience), followed by your perceptions on voice problems seen in singers and how they cope with them. Singers will draw on their personal experiences while speech and language therapists and vocal coaches will offer their views based on their experience dealing with singers.

What are the possible disadvantages and risks of taking part?

The interview will take about 60 minutes of your time. In addition, in rare circumstances it may evoke memories of unpleasant past experiences relating to your voice, but we do not expect these to be extreme. If you do, however, feel stressed at any point of the interview, or if you get tired, you can ask to have a break or to stop without giving a reason.

What are the possible benefits of taking part?

You will not be financially reimbursed for taking part in the study. There are no direct benefits to you but taking part in this research will give you an opportunity to discuss your experiences, which you may find

useful. This research could be beneficial to helping other singers with voice problems, as the results may be used to map out successful coping strategies and develop interventions.

Data privacy statement

City, University of London is the sponsor and the data controller of this study based in the United Kingdom. This means that we are responsible for looking after your information and using it properly. The legal basis under which your data will be processed is City's public task.

Your right to access, change or move your information are limited, as we need to manage your information in a specific way in order for the research to be reliable and accurate. To safeguard your rights, we will use the minimum personal-identifiable information possible (for further information please see https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-dataprotection-regulation-gdpr/lawful-basis-for-processing/public-task/).

City will use your name and contact details to contact you about the research study as necessary. If you wish to receive the results of the study, your contact details will also be kept for this purpose. Only the

researcher and the supervisors will have access to your data. City will keep identifiable information about you from this study for 10 years after the study has finished.

You can find out more about how City handles data by visiting https://www.city.ac.uk/about/governance/legal. If you are concerned about how we have processed your personal data, you can contact the Information Commissioner's Office (IOC) https://ico.org.uk/.

I do not speak English; can I still take part?

The researcher can speak English, Tamil, Malayalam, Hindi and Kannada. If your preferred language choice is any of those mentioned, you can still take part in the study, should you choose to do so.

Will my taking part in the study be kept confidential?

The interviews will be audio recoded and only the researchers and the supervisors will have access to personal information provided from interviews, during the duration of the study. After the end of the

study, all personal information will be securely destroyed. Once processed, research records and anonymised data will be stored securely at City, University of London for 10 years. Any reports from the research may use anonymised quotes to illustrate research findings, however participants will not be identifiable from these quotes.

Please note should any safeguarding issues or any other issues of concern arise during the study the researcher may have to report these to the relevant authorities, as part of our duty of care towards you and anyone involved.

What will happen when the research study is completed?

All data will be stored securely as part of City, University of London guidelines for 10 years. The data will be stored anonymously and after the 10-year period, electronic data will be electronically shredded, and hard copies shredded after retrieval from secure archives.

What will happen to the results of the research study?

It will be written up to form a part of a PhD project. Academic papers may result in being presented at formal conferences and seminar to local community groups. Participant anonymity will be maintained for all results produced. Research findings will be written in accordance with the University requirements of a PhD Research Project which will be available to participants upon request.

What will happen if I do not want to carry on with this study?

You are free to withdraw from the study without an explanation or penalty until the data has been transcribed. Should you wish to discontinue, all personally identifiable information will be erased automatically.

Who has reviewed the study?

The study has been approved by City, University of London School of Health Sciences Research Ethics Committee.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team, details are below. If you remain unhappy and wish to complain

formally, you can do this through City's complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is "Voice problems and coping strategies in Western Classical and Carnatic singers: Exploring Perceptions of Singers, Speech & Language Therapists and vocal coaches."

You can also write to the Secretary at:

Anna Ramberg
Research Integrity Manager
City, University of London, Northampton Square
London, EC1V 0HB
Email: Anna.Ramberg.1@city.ac.uk

Insurance

City University London holds insurance policies which apply to this study, subject to the terms and conditions of the policy. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Further information and contact details

Researcher: Aparna Ramachandran
aparna.ramachandran@city.ac.uk

Supervisors: Dr Shashivadan P. Hirani
shashi.hirani@city.ac.uk
+44 (0)20 7040 0880

Prof Katerina Hilari
K.Hilari@city.ac.uk
+44 (0)20 7040 4660

ETHICS APPROVAL LETTER FOR QUALITATIVE STUDY

Dear Aparna

Reference: ETH1920-0100

Project title: Self-reported voice problems and coping strategies in Western Classical and Carnatic singers: An exploratory study of perceptions among singers, Vocal Coaches and Speech and language therapists

Start date: 25 Feb 2020

End date: 1 Dec 2020

I am writing to you to confirm that the research proposal detailed above has been granted formal approval from the Language & Communication Science Proportionate Review Committee. The Committee's response is based on the protocol described in the application form and supporting documentation. Approval has been given for the submitted application only and the research must be conducted accordingly. You are now free to start recruitment.

The approval was given with the following conditions:

- ...
- ...
- ...

Please ensure that you are familiar with City's Framework for Good Practice in Research and any appropriate Departmental/School guidelines, as well as applicable external relevant policies.

Please note the following:

Project amendments/extension

You will need to submit an amendment or request an extension if you wish to make any of the following changes to your research project:

- Change or add a new category of participants;
- Change or add researchers involved in the project, including PI and supervisor;
- Change to the sponsorship/collaboration;

- Add a new or change a territory for international projects;
- Change the procedures undertaken by participants, including any change relating to the safety or physical or mental integrity of research participants, or to the risk/benefit assessment for the project or collecting additional types of data from research participants;
- Change the design and/or methodology of the study, including changing or adding a new research method and/or research instrument;
- Change project documentation such as protocol, participant information sheets, consent forms, questionnaires, letters of invitation, information sheets for relatives or carers;
- Change to the insurance or indemnity arrangements for the project;
- Change the end date of the project.

Adverse events or untoward incidents

You will need to submit an Adverse Events or Untoward Incidents report in the event of any of the following:

a) Adverse events

b) Breaches of confidentiality

c) Safeguarding issues relating to children or vulnerable adults

d) Incidents that affect the personal safety of a participant or researcher

Issues a) and b) should be reported as soon as possible and no later than five days after the event. Issues c) and d) should be reported immediately. Where appropriate, the researcher should also report adverse events to other relevant institutions, such as the police or social services.

Should you have any further queries relating to this matter, please do not hesitate to contact me. On behalf of the Language & Communication Science Proportionate Review Committee, I do hope that the project meets with success.

Kind regards

[redacted]

Appendix 4.3-Proforma and Interview Schedules for the three participant groups

PROFORMA FOR QUALITATIVE STUDY-SLT

NAME OF THE PARTICIPANT:

AGE/SEX:

ADDRESS:

OCCUPATION:

EDUCATION:

DURATION OF PROFESSIONAL EXPERIENCE:

CLINIC/HOSPITAL DETAILS:

GENRE OF SINGERS COMMONLY SEEN:

LOCATION OF THE INTERVIEW:

TYPE OF INTERVIEW:

DATE OF INTERVIEW:

INTERVIEWER:

INTERVIEW SCHEDULE-SLTs

Before commencement of the interview, the researcher will check if the recording equipment is in order. The interview will commence with the researcher and the participant introducing each other. The participant will be briefed about the particulars of the interview such as the duration of the meeting, potential topics which will be touch upon and so on. The consent form will be provided to the participant to be read and signed. The researcher will reconfirm if the contents of the information sheet have been understood and if their questions were answered in a satisfactory manner. The participant will be provided with an operational definition of coping to clarify what coping means in the present study. Coping, in this study is defined as behavioural and emotional measures or modifications taken by a singer to deal with voice problems. The participant will be informed that they can ask any questions or clarifications at any point of the interview and they can take breaks in between if they wish to do so. Following this, the formal interview process will commence.

Ice breaker: Participants will be asked details about their professional experience such as duration of practice, primary genre of music they are associated with and education along with basic demographic details such as age. The standardised proforma developed for the study will be filled to generate descriptive statistics for each participant.

The following questions will be asked in the interview:

1. How would you describe a normal voice?
    - Pitch
    - Loudness
    - Quality
    - Resonance

2. What are the most commonly reported voice problems in singers?

    Possible prompts:
    - How soon do they come to you after the onset of a problem?
    - Is the onset sudden/gradual?
    - How are these patients different from non-singers?

3. How do singers cope with voice problems?

   Possible prompts

   - Self-help?
   -

4. What do you think are the main causes of voice problems in singers?

   Possible prompts

   - Lifestyle?
   - Bad singing technique?
   - Singing while unwell?
   - Age?

5. How do you assess self-reported voice problems in singers? Are they effective in identifying subtle voice problems specific to singers?
   - How is the assessment protocol different while assessing singers?
   - Any particular gaps?

6. Do you assess voice related coping in singers as part of your assessment battery? If yes, can you describe your assessment methods?

   - If no, is it because of lack of appropriate tools?
   - What do you think are the clinical implications of voice related coping assessment? Does it play a role in therapy efficacy?

7. We are approaching the end of our interview. I there anything else you would like to add about voice problems in singers or coping with voice problems? Do you have any questions?

PROFORMA FOR QUALITATIVE STUDY-SINGERS

NAME OF THE PARTICIPANT:

AGE/SEX:

ADDRESS:

OCCUPATION:

PART TIME/FULL TIME SINGER:

PRIMARY GENRE:

YEARS OF TRAINING:

DURATION OF SINGING EXPERIENCE:

LOCATION OF THE INTERVIEW:

TYPE OF INTERVIEW:

DATE OF INTERVIEW:

INTERVIEWER:

INTERVIEW SCHEDULE-SINGERS

Before commencement of the interview, the researcher will check if the recording equipment is in order. The interview will commence with the researcher and the participant introducing each other. The participant will be briefed about the particulars of the interview such as the duration of the meeting, potential topics which will be touch upon and so on. The consent form will be provided to the participant to be read and signed. The researcher will reconfirm if the contents of the information sheet have been understood and if their questions were answered in a satisfactory manner. The participant will be informed that they can ask any questions or clarifications at any point of the interview and they can take breaks in between if they wish to do so. Following this, the formal interview process will commence.

Ice breaker: Participants will be asked details about their singing such as years of training and professional singing, primary genre of music they are associated with, other occupations along with basic demographic details such as age. The standardised proforma developed for the study will be filled to generate descriptive statistics for each participant.

The following questions will be asked in the interview:

1. How would you describe a normal voice?
    - Pitch
    - Loudness
    - Quality
    - Resonance
2. Have you faced/ do you face any voice problems which affects your singing? If yes, can you tell me about it?

    Possible prompts:
    - Providing examples such as reduced pitch range, fatigue etc if no voice problems are reported
    - When did you notice the problem?
    - Was the onset sudden/gradual?
    - How did it affect your performance?
    - What happened next?

- Do you still have the problem(s)?
- How does having a voice problem make you feel?

3. What do you do when you have a voice problem?

   Possible prompts

   - Who do you first approach for medical help??
   - Self-help?
   - Do you avoid singing?
   - Does social support work?

4. What do you think are the main causes of voice problems in singers?

   Possible prompts

   - Lifestyle?
   - Bad singing technique?
   - Singing while unwell?
   - Age?

5. Do you think voice problems are understood by medical professionals?
   - Are they sensitive/well informed of singing related voice problems and associated terminology?
   - Any particular gaps?

6. How does a voice problem impact a singer?
   - Performance
   - Financial
   - Emotional
   - Physical

7. Do you think singers can be helped when they have a voice problem? Can voice problems be managed?
   - By whom?

- How?
- Do you think voice problems are permanent?

8. We are approaching the end of our interview. I there anything else you would like to add about voice problems in singers or coping with voice problems? Do you have any questions?

PROFORMA FOR QUALITATIVE STUDY-VOCAL COACHES

NAME OF THE PARTICIPANT:

AGE/SEX:

ADDRESS:

OCCUPATION:

PART TIME/FULL TIME VOCAL COACH:

PRIMARY GENRE:

YEARS OF TRAINING:

DURATION OF TEACHING EXPERIENCE:

LOCATION OF THE INTERVIEW:

TYPE OF INTERVIEW:

DATE OF INTERVIEW:

INTERVIEWER:

INTERVIEW SCHEDULE-VOCAL COACHES

Before commencement of the interview, the researcher will check if the recording equipment is in order. The interview will commence with the researcher and the participant introducing each other. The participant will be briefed about the particulars of the interview such as the duration of the meeting, potential topics which will be touch upon and so on. The consent form will be provided to the participant to be read and signed. The researcher will reconfirm if the contents of the information sheet have been understood and if their questions were answered in a satisfactory manner. The participant will be provided with an operational definition of coping to clarify what coping means in the present study. Coping, in this study is defined as behavioural and emotional measures or modifications taken by a singer to deal with voice problems. The participant will be informed that they can ask any questions or clarifications at any point of the interview and they can take breaks in between if they wish to do so. Following this, the formal interview process will commence.

Ice breaker: Participants will be asked details about their professional experience such as duration of teaching experience, primary genre of music they are associated with and training details along with basic demographic details. The standardised proforma developed for the study will be filled to generate descriptive statistics for each participant.

The following questions will be asked in the interview:

1. How would you describe a normal voice?
    - Pitch
    - Loudness
    - Quality
    - Resonance

2. What are the most commonly reported voice problems seen in singers?
   Possible prompts:
    - Do they come to you first before approaching a medical professional after the onset of a problem?
    - How often do you see voice problems in singers?

3. How do singers cope with voice problems?

Possible prompts

- Self-help?
- Social support?

4. What do you think are the main causes of voice problems in singers?

   Possible prompts

   - Lifestyle?
   - Bad singing technique?
   - Singing while unwell?
   - Age?

5. What is your approach when you notice a singer developing a voice problem?
   a. Do you offer advice?
   b. When do you recommend seeing a medical professional?
   c. Who would you recommend visiting for voice problems?-GP, ENT, SLT?

6. Do you think voice problems are understood by medical professionals?
   - Are they sensitive/well informed of singing related voice problems and associated terminology?
   - Any particular gaps?

7. How does a voice problem impact a singer?
   - Performance
   - Financial
   - Emotional
   - Physical

8. Do you think singers can be helped when they have a voice problem? Can voice problems be managed?
   - By whom?
   - How?
   - Do you think voice problems are permanent?

9. We are approaching the end of our interview. I there anything else you would like to add about voice problems in singers or coping with voice problems? Do you have any questions?

Appendix 5.1: Checklist for Reporting Of Survey Studies (CROSS) guidelines in relation to the survey

Section/topic	Item	Item description	Reported on page #
Title and abstract			
Title and abstract	1a	State the word "survey" along with a commonly used term in title or abstract to introduce the study's design.	NA
	1b	Provide an informative summary in the abstract, covering background, objectives, methods, findings/results, interpretation/discussion, and conclusions.	NA
Introduction			
Background	2	Provide a background about the rationale of study, what has been previously done, and why this survey is needed.	225,226
Purpose/aim	3	Identify specific purposes, aims, goals, or objectives of the study.	227
Methods			
Study design	4	Specify the study design in the methods section with a commonly used term (e.g., cross-sectional or longitudinal).	227
	5a	Describe the questionnaire (e.g., number of sections, number of questions, number and names of instruments used).	Table 5.1
Data collection methods	5b	Describe all questionnaire instruments that were used in the survey to measure particular concepts. Report target population, reported validity and reliability information, scoring/classification procedure, and reference links (if any).	228-233; Table 5.1
	5c	Provide information on pretesting of the questionnaire, if performed (in the article or in an online supplement). Report the method of pretesting, number of times questionnaire was pre-tested, number and demographics of participants used for pretesting, and the level of similarity of demographics between pre-testing participants and sample population.	237
	5d	Questionnaire if possible, should be fully provided (in the article, or as appendices or as an online supplement).	Appendix 5.3
Sample characteristics	6a	Describe the study population (i.e., background, locations, eligibility criteria for participant inclusion in survey, exclusion criteria).	227,228
	6b	Describe the sampling techniques used (e.g., single stage or multistage sampling, simple random sampling, stratified sampling, cluster sampling, convenience sampling). Specify the locations of	228

		sample participants whenever clustered sampling was applied.	
	6c	Provide information on sample size, along with details of sample size calculation.	243
	6d	Describe how representative the sample is of the study population (or target population if possible), particularly for population-based surveys.	NR
Survey administration	7a	Provide information on modes of questionnaire administration, including the type and number of contacts, the location where the survey was conducted (e.g., outpatient room or by use of online tools, such as SurveyMonkey).	228, 233
	7b	Provide information of survey's time frame, such as periods of recruitment, exposure, and follow-up days.	228
	7c	Provide information on the entry process: –>For non-web-based surveys, provide approaches to minimize human error in data entry. –>For web-based surveys, provide approaches to prevent "multiple participation" of participants.	233
Study preparation	8	Describe any preparation process before conducting the survey (e.g., interviewers' training process, advertising the survey).	228
Ethical considerations	9a	Provide information on ethical approval for the survey if obtained, including informed consent, institutional review board [IRB] approval, Helsinki declaration, and good clinical practice [GCP] declaration (as appropriate).	227,233
	9b	Provide information about survey anonymity and confidentiality and describe what mechanisms were used to protect unauthorized access.	233
Statistical analysis	10a	Describe statistical methods and analytical approach. Report the statistical software that was used for data analysis.	239-243
	10b	Report any modification of variables used in the analysis, along with reference (if available).	NA
	10c	Report details about how missing data was handled. Include rate of missing items, missing data mechanism (i.e., missing completely at random [MCAR], missing at random [MAR] or missing not at random [MNAR]) and methods used to deal with missing data (e.g., multiple	239,240,248,252

		imputation).	
	10d	State how non-response error was addressed.	239,240
	10e	For longitudinal surveys, state how loss to follow-up was addressed.	NA
	10f	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for non-representativeness of the sample.	NR
	10g	Describe any sensitivity analysis conducted.	NR
Results			
Respondent characteristics	11a	Report numbers of individuals at each stage of the study. Consider using a flow diagram, if possible.	NA
	11b	Provide reasons for non-participation at each stage, if possible.	NA
	11c	Report response rate, present the definition of response rate or the formula used to calculate response rate.	NR
	11d	Provide information to define how unique visitors are determined. Report number of unique visitors along with relevant proportions (e.g., view proportion, participation proportion, completion proportion).	NA
Descriptive results	12	Provide characteristics of study participants, as well as information on potential confounders and assessed outcomes.	246,247, Table 6.1
Main findings	13a	Give unadjusted estimates and, if applicable, confounder-adjusted estimates along with 95% confidence intervals and p-values.	NA
	13b	For multivariable analysis, provide information on the model building process, model fit statistics, and model assumptions (as appropriate).	242,243, Table 5.2,321
	13c	Provide details about any sensitivity analysis performed. If there are considerable amount of missing data, report sensitivity analyses comparing the results of complete cases with that of the imputed dataset (if possible).	NR
Discussion			
Limitations	14	Discuss the limitations of the study, considering sources of potential biases and imprecisions, such as non-representativeness of sample, study design, important uncontrolled confounders.	347,348

Interpretations	15	Give a cautious overall interpretation of results, based on potential biases and imprecisions and suggest areas for future research.	349,350
Generalizability	16	Discuss the external validity of the results.	361,362
Other sections			
Role of funding source	17	State whether any funding organization has had any roles in the survey's design, implementation, and analysis.	NA
Conflict of interest	18	Declare any potential conflict of interest.	NA
Acknowledgements	19	Provide names of organizations/persons that are acknowledged along with their contribution to the research.	NA

Appendix 5.2-Ethics application documents for survey

ETHICS APPLICATION

Ethics ETH2122-0107: Mrs Aparna Ramachandran (Low risk)

Date Created: 18 Aug 2021

Date Submitted: 26 Aug 2021

Date of last resubmission: 08 Nov 2021

Date forwarded to: 27 Aug 2021 committee

Academic Staff: Mrs Aparna Ramachandran

Student ID: 190002319

Category: Doctoral Researcher

Supervisor: Dr Shashi Hirani

Project: SELF-REPORTED VOICE PROBLEMS AND COPING STYLES IN WESTERN CLASSICAL AND CARNATIC SINGERS: A MIXED METHODS STUDY

School: School of Health & Psychological Sciences

Department: Nursing

Current status: Approved after amendments made

Ethics application

Risks

R1) Does the project have funding? Yes

R2) Does the project involve human participants?

Yes

R3) Will the researcher be located outside of the UK during the conduct of the research?

No

R4) Will any part of the project be carried out under the auspices of an external organisation, involve collaboration between institutions, or involve data collection at an external organisation?

Yes

R5) Does your project involve access to, or use of, terrorist or extremist material that could be classified as security sensitive?

No

R6) Does the project involve the use of live animals?

No

R7) Does the project involve the use of animal tissue?

No

R8) Does the project involve accessing obscene materials?

No

R9) Does the project involve access to confidential business data (e.g. commercially sensitive data, trade secrets, minutes of internal meetings)?

No

R10) Does the project involve access to personal data (e.g. personnel or student records) not in the public domain?

No

R11) Does the project involve deviation from standard or routine clinical practice, outside of current guidelines?

No

R12) Will the project involve the potential for adverse impact on employment, social or financial standing?

No

R13) Will the project involve the potential for psychological distress, anxiety, humiliation or pain greater than that of normal life for the participant?

No

R15) Will the project involve research into illegal or criminal activity where there is a risk that the researcher will be placed in physical danger or in legal jeopardy?

No

R16) Will the project specifically recruit individuals who may be involved in illegal or criminal activity?

No

R17) Will the project involve engaging individuals who may be involved in terrorism, radicalisation, extremism or violent activity and other activity that falls within the CounterTerrorism and Security Act (2015)? No

Applicant & research team

T1) Principal Applicant

Name

Mrs Aparna Ramachandran

T2) Co-Applicant(s) at City

T3) External Co-Applicant(s)

T4) Supervisor(s)

Dr Shashi Hirani

Prof Katerina Hilari

Dr Ruth Epstein

T5) Do any of the investigators have direct personal involvement in the organisations sponsoring or funding the research that may give rise to a possible conflict of interest?

No

T6) Will any of the investigators receive any personal benefits or incentives, including payment above normal salary, from undertaking the research or from the results of the research above those normally associated with scholarly activity?

No

T7) List anyone else involved in the project.

Project details

P1) Project title

A survey of self-reported voice problems and coping styles in Western Classical and Carnatic singers

P1.1) Short project title

Survey of voice problems and coping in classical singers

P2) Provide a lay summary of the background and aims of the research, including the research questions (max 400 words).

Singers are considered vocal athletes, as they use their voices in intricate and challenging ways (Phyland et al, 2013). Various studies have indicated a high prevalence of self-reported voice problems among classical singers (Phyland et al, 2013; Tepe et al, 2002; Phyland, Oates & Greenwood, 1999, Devadas et al, 2018). Classical singing encompasses various styles within itself, of which Western Classical and Carnatic singing are two types. Western Classical music refers to style of music which originated during the "classical period" including a vast range of music styles most of which were closely linked to the religious beliefs and practises of that era (Palsule, 2015). Carnatic music, belonging to South India, emerged from ancient Hindu traditions, and also has a strong religious influence. Devadas et al (2018) reported that the prevalence of self-reported voice problems is highly variable across singing styles. Therefore, a comparison of self-reported voice problems between Western Classical and Carnatic styles would facilitate better understanding of pedagogical issues, aspects of vocal health and the differences across cultures, ethnic groups and geographical boundaries (Boominathan, 2007).

Voice problems in singers range from subtle, transient changes in vocal fold mucosa to more severe voice pathologies with physiological, aerodynamic and acoustic consequences ultimately reflecting in their singing performance. Self-assessment scales and questionnaires are sensitive to significant deviations in voice; however, they fall short in identifying the covert voice changes commonly reported by singers

(Phyland et al, 2013; Behlau, Madazio & Oliviera, 2015). Clinical classification of these variations is difficult since their presentation is not obvious and the current assessment methods are not designed for the clinically normal or 'normophobic' singer (Phyland et al, 2013). These changes are primarily pertaining to vocal quality and endurance and albeit elusive, can prove to be detrimental to a singers' career; therefore, identification of these deviations is important. Also, the possibility of differences in risk for laryngeal pathology and vocal symptoms between different singing styles has been indicated (Kwok and Eslick, 2017) but has not received much research attention.

As part of dealing with voice problems, singers may adopt various coping processes which can have an impact on their well-being and quality of life (Behlau, Madazio & Oliviera, 2015). Coping can be understood as an adaptational response to a situation or 'stressor' using cognitive or behavioural processes to manage the stress of illness (Folkman and Lazarus, 1987; Epstein et al, 2009). Individuals with voice disorders adopt coping strategies with positive or negative outcomes (Epstein et al, 2009), however, this has not been studied in singers. Since coping can be influenced by cultural factors (Lazarus & Folkman, 1987) such as singing styles, the mechanisms of coping can be expected to be different in Western classical singers and Carnatic singers even though this has not yet been explored empirically.

Objectives

1. Identify the self-reported voice problems and coping styles of Western classical and Carnatic professional singers.
2. Examine if there is an association between coping and self-reported voice problems by carrying out correlation analysis of self-reported voice problems and coping styles
3. Compare the severity and nature of self-reported voice problems and coping styles between Western Classical and Carnatic singers; and within groups to ascertain the impact of culture, demographic and singing related variables on vocal health and quality of life.

P4) Provide a summary and brief explanation of the research design, method, and data analysis.

Design

A cross sectional design using a self-reported survey of vocal problems and coping strategies will be completed by singers belonging to Western classical and Carnatic traditions.

Participants

Inclusion criteria:

• Singers who self-identify as being associated with Western classical or Carnatic traditions primarily (singers can be involved with other genres, however their main performing genre should be classical)

• Participants will have undergone singing training (of respective genres) or currently undergoing training (singing students) for a minimum of 1 year

• Above 18 years of age

Sample size:

G*Power (Faul et al, 2009) was used to determine sample size. For a 2-group comparison (using ANOVA or ANCOVA) with alpha at 0.05, power at 90%, medium effect size (f=0.25) there will need to be 172 total (participants 86 per group). This is also sufficient to conduct multiple regression (alpha =

0.05, power = 90%, medium effect size f2=0.15) with 15 predictors (required n=171). The responses will also allow a Principal Components Analysis of the VDCQ-27 with an item to participant ratio of 6, if all items are included and ratio of approximately 9 if 20 items are retained (the published VDCQ has 15 items).

Data collection

Singers will first be recruited using existing professional network connections of the researcher These will predominantly be classical singers based in the UK and India. Further participants will be recruited using snowball sampling methods.

Additionally, the British Voice Association, which has an extensive database of Classical singers in the UK will be approached to assist in data collection (the external supervisor is a senior member of the BVA and will facilitate this). The external supervisor also has access to senior faculties of the Royal College of Music which will also be utilised as sources of classical singer participants. The organisations will be requested to send out the invite email requesting participation, on behalf of the research team. A draft of thefirst email and the reminder email is provided in Appendix 1.

Personal and professional connections (n=30) of the researcher (who is a Carnatic singer) will be utilised for approaching Carnatic singers for data collection. These connections will be asked to contact their networks which will increase representativeness. The Carnatic music fraternity in India is a very close-knit community, therefore it would be realistic to obtain enough participants for the study. The subjects will be approached via email. Informed consent will be obtained from all participants. Two reminders will be sent following the first email. A draft of the first email and reminder email is provided in Appendix 2. Additionally, social media avenues such as Facebook and Twitter will also be explored for data collection.

Facebook pages such as Rasikas.org, Carnatic music group, the Opera singer network and Western Classical music which have a significant number of Classical singers across ages and experience levels will be used to advertise and request study participation. Draft posts are provided in Appendix 3.

Procedures

Survey instrument:

The development of the survey instrument is informed by:

- The results of a qualitative study which aimed to explore perceptions of singers, singing teachers and SLTs regarding various aspects of self-reported voice problems and voice related coping in singers.
- A systematic review performed to identify voice related coping in professional voice users
- A systematic review which focused on identifying self-reported voice problems in Classical singers.

After collating all the results from the above-mentioned studies, the following 'themes' were chosen to be included in the survey instrument:

1. Demographic information:

1.1. Age, sex, Country of residence, Nationality

2. Singing history

2.1. Primary genre, Other genres performed, Voice type (WC only), Performance level for primary genre (amateur, semi-professional, professional, student), Singing experience in years, Type of performance(solo/group/duo), Average performance hours per week, Average practice hours per week

3. Training history

3.1. Starting age of training, Amount of training (years), Genre(s) in which training was obtained4. Medical history

4.1. Current/past relevant illnesses, surgeries

5. Perception of own voice

5.1. Descriptors such as big, warm, steady, dependable

5.2. How others (audience, singing teacher, conductor etc) have described your voice

5.3. Do you like your own voice?

6. Vocal problems

6.1. Current vocal problems which may interfere with performance

6.2. Voice problems in the past since you began singing

(If yes to 6.1 or 6.2 continue answering this section)

6.2.1. Timeline of voice problem

6.2.2. Onset

6.2.3. Nature

6.3. Vocal symptoms

6.3.1. Change in voice quality/timbre (dysphonia) (harsh, hoarse, breathy, husky), Problems related to pitch (reaching higher or lower notes, reduced range), Problems related to volume (singing softly/loudly/reduced range), Lack of power, Vocal fatigue, Vocal discomfort (pain, tightness, dryness, itch), Vocal strain/effortful singing, Lack of control (unsteady voice), Problems sustaining notes, Voice breaks, Lack of flexibility, Resonance problems, Problems with transition between registers/passaggio, Lack of breath support/control, Loss of voice, Coughing/throat clearing, Loss of form, Difficulty with vocal ornaments, Other

7. Vocal behaviours

7.1. Speaking/singing loudly, Over singing, singing in extreme pitches, Throat clearing, Singing while unwell, Clenching jaw/teeth while singing, Warm-up/cool-down

8. Factors affecting voice (questions will reflect both beliefs and practices)

8.1. Lifestyle (Sleep, Alcohol, Caffeine, Tobacco, Spicy/oily foods, Dairy, Exercise, Body weight, Water intake), PMS, Menstruation, Menopause, Oral contraceptives, Frequent cold, Allergies, Medical conditions (e.g.: asthma), Medication, Stress, Performance anxiety

9. Maintaining vocal health (questions will reflect both beliefs and practices)

9.1. Voice rest, Avoiding/consuming certain foods, Regular vocal practice/vocal exercises, Positive attitude, Warm up/cool down, Other

10. Standardised tools to measure voice problems in singers

In addition to the questionnaire, a standardised tool will also be included in the survey instrument.

Two tools are being considered-the Singing Voice Handicap Index-10 (SVHI-10) developed by

Cohen et al (2009) and the Evaluation of Ability to Sing Easily (EASE) developed by Phyland et al (2013). The SVHI-10 is a shortened version of the Singing Voice Handicap Index which is a validated health status instrument for singers to assess self-perceived handicap associated with singing voice problems. EASE is a concise clinical tool which was developed to assess singers' perceptions of the current status of their singing voice. After the questionnaire is prepared, a final decision on which of these will be included in the survey instrument will be made to ensure minimal participant burden and repetition of items.

11. Voice related quality of life measured using VR-QOL (Hogikyan and Sethuraman, 1999)

12. Coping

12.1. Mainly assessed using VDCQ-27 (Epstein et al, 2009)

12.2. Factors affecting coping

The response scales will include Likert format (frequency, severity and agreement scales), yes/no, multiple choice and open-ended responses and will be appropriately chosen to suit the nature of the question and as per validated questionnaires where available. The survey will take approximately 30 minutes to complete (10 minutes for the questionnaire, 10 minutes for the standardised voice questionnaires and 10 minutes for VDCQ). Considerations to make certain sections of the questionnaire optional will be made to maximise participation and reduce participant burden. Also, the items will be ordered to include the themes most relevant to the research questions to enhance the usefulness of partially filled responses.

The online survey will be designed and distributed using Qualtrics software. The survey will be run for a maximum period of 3 months which will commence as soon as approvals are received.

Analysis

Descriptive statistics (means, SD; medians, IQR; normality) will be utilised to describe the levels of vocal problem, and frequency of coping strategy utilisation depending on the parametric (or not) nature of the data. The factor structure of measures will be investigated using PCA (Principal Components Analysis) to reduce items into more manageable scale scores.

Comparisons between groups will be explored using ANOVA's and ANCOVAs. Pearson's/

Spearman's correlation's will be used to examine relationships between continuous variables, with

Chi-square analysis for categorical data relationships. These associations will be followed by (hierarchical) multiple regression analyses to explore how demographic, professional, and coping variables influence vocal outcomes.

Cluster Analyses of participant coping strategies will be explored to investigate if there are profiles of singer coping styles that have certain singing characteristics and whether they are indicative of vocal outcomes.

P4.1) If relevant, please upload your research protocol.

P5) What do you consider are the ethical issues associated with conducting this research and how do you propose to address them?

Participant burden: Even though completing a survey does not entail any harm, time commitment could cause participant burden. To potentially reduce this, the survey settings pertaining to completion of the survey in Qualtrics will be set for one month which implies that the participant can complete the survey over multiple sittings within one month of commencing the survey. Also, display logic and skip logic, which are features of Qualtrics, have been extensively used while designing the survey to enable participants to answer only relevant parts of the questionnaire, thereby reducing participant burden.

Confidentiality: No names or any other identifiable information will be collected, and the general demographic information will not enable identification of participants. For the online survey, no IP addresses will be collected by the survey. If a participant discloses identifiable information, for instance, while answering open ended questions, it will be de-identified before being analysed. Participants will be able to provide contact email details to ensure they gain as summary of the results. This will be in a separate survey link, so these details are not identifiable to the participants responses.

Informed consent: A detailed participant information sheet will be included at the start of the online survey at the Qualtrics landing page following University guidance. The participants can access this, have time to consider and complete the survey when desired. Confirming continuance into the survey will constitute consent as per City guidance for an anonymous survey.

Psychological distress: In a few participants, psychological distress may be caused by participants reflecting and thinking about their voice problem and its impact. Participants will be able to discontinue or pull out of the survey until they have submitted the survey should they wish to do so. This will be explicitly mentioned in the participant information sheet. Also, participants will be recommended to visit

their General Practitioner (or international equivalent) if they are experiencing voice problems that are a worry to them, as the researchers cannot provide clinical services.

P6) Project start date

The start date will be the date of approval.

P7) Anticipated project end date

29 Apr 2022

P8) Where will the research take place?

Recruitment and participation online via Qualtrics.

Home office of the researcher

Analysis completed on PC of researcher and first supervisor and online secure University Onedrive storage

P10) Is this application or any part of this research project being submitted to another ethics committee, or has it previously been submitted to an ethics committee? No

Funding

F1) Funder

City, University of London (PhD Studentship)

F2) Does the funder require external membership on the approving REC?

No

F3) Has the funding been approved?

Yes

F4) Value of grant £ 60000

External organisations

E1) Provide details of the external organisation/institution involved with this project.

1. The British Voice Association (BVA), which has an extensive database of Classical singers in the UK has been approached assist with data collection (proof of correspondence is attached).

2. The Royal College of Music has also been approached and a firm contact has been established using the connections of Dr Epstein with senior faculty members of the RCM.

E2) If applicable, has permission to conduct research in, at or through another institution or organisation been obtained? No

Human participants: information and participation

The options for the following question are one or more of:

'Under 18'; 'Adults at risk'; 'Individuals aged 16 and over potentially without the capacity to consent'; 'None of the above'.

H1) Will persons from any of the following groups be participating in the project?

None of the above

H2) How many participants will be recruited?

230

H3) Explain how the sample size has been determined.

G*Power (Faul et al, 2009) was used to determine sample size. For a 2-group comparison with alpha at 0.05, power at 90%, medium effect size (f=0.25) there will need to be 172 total (participants 86 per group). This is sufficient to conduct multiple regression (alpha = 0.05, power = 90%, medium effect size f2=0.15) with 15 predictors (required n=171). The 171 responses will also allow a Principal Components Analysis of the VDCQ-27 with an item to participant ratio of 6 if all items are included and ratio of approximately 9 if 20 items are retained (the published VDCQ has 15 items). 230 participants has been chosen as the maximum number of participants to be recruited to allow for partial data completion of approximately 25% on the online survey

H4) What is the age group of the participants?

Lower

18

H5) Please specify inclusion and exclusion criteria.

Inclusion criteria:

• Singers who self-identify as belonging to Western classical or Carnatic traditions

• Undergone singing training (of respective genres) or currently undergoing training (singing students) for a minimum of 1 year

• Participants above 18 years of age

• Participants with reasonable levels of English competency to complete the survey (available only in English-further justification has been provided in the notes section of the ethics application)

H6) What are the potential risks and burdens for research participants and how will you minimise them?

Risks

1. No emotional or psychological distress is likely while filling out the survey, however, should any participant feel any psychological discomfort, Participants will be able to discontinue or pull out of the survey until they have submitted the survey should they wish to do so. This will be explicitly mentioned in the participant information sheet

2. The methodology has been formulated to adhere to the principles, rights and obligations of the GDPR, tailored by the Data Protection Act 2018 to reduce any risks associated with data collection and analysis.

3. The paper format of the survey pack will include a consent form which will have identifiable details such as name, signature and email address. To reduce risks of compromising anonymity, consent forms and the actual survey responses will be filed and stored separately so consent forms cannot be traced back to its corresponding survey form. An option to return the completed survey via freepost or email (scanned copy of responses) will be provided to participants preferring the paper format.

Burdens

Even though completing a survey does not entail any harm, time commitment could cause participant burden. To potentially reduce this, the survey settings pertaining to completion of the survey in Qualtrics will be set for one month which the participant will be informed of that they can complete the survey over multiple sittings within one month of commencing the survey (on the same device). This should provide a reasonable span of time to allow participants to find a convenient time to schedule and complete the survey.

H7) Will you specifically recruit pregnant women, women in labour, or women who have had a recent stillbirth or miscarriage (within the last 12 months)?

No

H8) Will you directly recruit any staff and/or students at City?

None of the above

H8.1) If you intend to contact staff/students directly for recruitment purpose, please upload a letter of approval from the respective School(s)/Department(s).

H9) How are participants to be identified, approached and recruited, and by whom?

Singers will first be recruited using existing professional network connections of the researcher These will predominantly be classical singers based in the UK and India. Further participants will be recruited using snowball sampling methods.

Additionally, the British Voice Association, which has an extensive database of Classical singers in the UK has been approached to assist with data collection-the administrator will send out blanket emails to all potential participants within the BVA, once ethical approval has been granted.

The external supervisor also has access to senior faculties of the Royal College of Music which will also be utilised as sources of classical singer participants. Blanket emails will be sent to relevant networks within the RCM as well. A draft of this email and the reminder email is provided in Appendix 1.

Personal and professional connections (n=30) of the researcher (who is a Carnatic singer) will be utilised for approaching Carnatic singers for data collection. These connections will be asked to contact their networks which will increase representativeness. The Carnatic music fraternity in India is a very close-knit community, therefore it would be realistic to obtain enough participants for the study. The subjects will be approached via email. Informed consent will be obtained from all participants. Two reminders will be sent following the first email. A draft of the first email is provided in Appendix 2. Additionally, social media avenues such as Facebook and Twitter will also be explored for data collection. Facebook pages such as Rasikas.org, Carnatic music group, the Opera singer network and Western Classical music which have a significant number of Classical singers across ages and experience levels will be used to advertise and request study participation. Draft posts are provided in Appendix 3.

Even though a detailed enquiry was made to identify any relevant local bodies which may need to be approached and sought consent from, no such bodies could be located. We attempted to contact at least 10 Carnatic music schools/organisations for the same; however, no responses were received.

It must be highlighted that ethical approval was provided by City university research ethics committee for a qualitative study within the current programme of research, which required Carnatic singers (based in India) to be interviewed (virtually) for the same and no recommendations were made or requested pertaining to obtaining ethical consent from local bodies.

Another point to be emphasised is that the primary sampling methodology adopted for this study is snowball sampling using existing contacts and utilising social media (which will involve participants from across different countries), rather than recruiting from organisations (other than the ones already mentioned in the application).

H10) Please upload your participant information sheets and consent form, or if they are online (e.g. on Qualtrics) paste the link below.

H11) If appropriate, please upload a copy of the advertisement, including recruitment emails, flyers or letter.

H12) Describe the procedure that will be used when seeking and obtaining consent, including when consent will be obtained.

Participants who click the Qualtrics link will be led onto the participant information page with a button to view (and download) the participant information sheet. Following this, they will then be able to progress to the consent page (or contact the researcher if they have a need for further information). On obtaining consent, they will proceed to the survey items which is standard City SHS practice for an anonymous survey. Participants will be able to access the Participant Information page and then leave the survey to consider their decision and return at a later stage from the time the survey opens to the day it closes. They will not receive a copy of the consent form. The consent is anonymous with no personal data such as name or signature.

H13) Are there any pressures that may make it difficult for participants to refuse to take part in the project?

No

H14) Is any part of the research being conducted with participants outside the UK?

No

Human participants: method

The options for the following question are one or more of:

'Invasive procedures (for example medical or surgical)'; 'Intrusive procedures (for example psychological or social)'; 'Potentially harmful procedures of any kind'; 'Drugs, placebos, or other substances administered to participants'; 'None of the above'.

M1) Will any of the following methods be involved in the project:

None of the above

M2) Does the project involve any deceptive research practices?

No

M3) Is there a possibility for over-research of participants?

No

M4) Please upload copies of any questionnaires, topic guides for interviews or focus groups, or equivalent research materials.

M5) Will participants be provided with the findings or outcomes of the project? Yes

M5.1) Explain how this information will be provided.

As per City guidelines participants will not be asked to email the researcher to receive information about the results of the survey. Using a secure approach within Qualtrics any participant wishing to receive a summary of the findings will be able to open a separate Qualtrics survey to provide their email address. This will keep the survey data separate from this personal contact information. The researcher will then send a blind carbon copy email to any participants with a short accessible, lay summary of the results.

Singers who completed the survey using the downloadable format and wished to obtain the results of the survey will be emailed the same.

M6) If the research is intended to benefit the participants, third parties or the local community, please give details.

Information gathered from singers will be beneficial to understand the unique vocal problems of singers and its impact on their well-being. This will benefit other singers with voice problems as well as provide an opportunity for the participants to reflect on their voice and vocal health.

M7) Are you offering any incentives for participating?

Yes

M7.1) Please give details, justifying their type and amount.

Four participants will stand a chance of winning a voucher worth £25 each. Only participants who complete the entire survey will be eligible and this will be explicitly mentioned in the participant information sheet. Winning participants will be randomly chosen using Google's random number generator. An independent Qualtrics link will be made for their email addresses which will be linked off the main questionnaire at the end of the survey to ensure that all responses have been recorded. This link cannot be linked to the survey responses, so the data will remain anonymous. All personal details will be deleted after the draw

M8) Does the research involve clinical trial or clinical intervention testing that does not require Health Research Authority or MHRA approval? No

M9) Will the project involve the collection of human tissue or other biological samples that does not fall under the Human Tissue Act (2004) that does not require Health Research Authority Research Ethics Service approval?

No

M10) Will the project involve potentially sensitive topics, such as participants' sexual behaviour, their legal or political behaviour, their experience of violence?

No

M11) Will the project involve activities that may lead to 'labelling' either by the researcher (e.g. categorisation) or by the participant (e.g. 'I'm stupid', 'I'm not normal')?

No

Data

D1) Indicate which of the following you will be using to collect your data.

Questionnaire

D2) How will the the privacy of the participants be protected?

Anonymised sample or data

D3) Will the research involve use of direct quotes?

No

D5) Where/how do you intend to store your data?

Data to be kept in a locked filing cabinet

Data and identifiers to be kept in separate, locked filing cabinets

Password protected computer files

Storage on encrypted device (e.g. laptop, hard drive, USB

Storage at City

D6) Will personal data collected be shared with other organisations?

No

D7) Will the data be accessed by people other than the named researcher, supervisors or examiners?

No

D8) Is the data intended or required (e.g. by funding body) to be published for reuse or to be shared as part of longitudinal research or a different/wider research project now or in the future?

No

D10) How long are you intending to keep the research data generated by the study?

10 years

D11) How long will personal data be stored or accessed after the study has ended?

Personal data will only be gathered from those participants who have been directly contacted by the researcher using personal connections, those requesting dissemination of the results after the study has completed or those who wish to participate in the draw (to win vouchers). These contact details will be kept until the survey summary is completed and sent to their contact email address and then deleted from Qualtrics (email addresses collected for the draw will be deleted after the winners have been drawn and notified). Research data will be transferred to the archives within the university and stored for 10 years, after which it will be destroyed.

D12) How are you intending to destroy the personal data after this period?

All hard copies will be shredded before they are discarded. All digital files will be virtually shredded using a standard digital file shredding algorithm. Data in Qualtrics and on password protected computer files to be securely deleted.

Health & safety

HS1) Are there any health and safety risks to the researchers over and above that of their normal working life?

No

HS3) Are there hazards associated with undertaking this project where a formal risk assessment would be required?

No

PARTICIPANT INFORMATION SHEET

REC ref: ETH2021-2096, 11/06/2021, Version 1.0

A survey of Self-reported voice problems and coping strategies in Western Classical and Carnatic singers

Name of principal investigator/researcher:

Aparna Ramachandran, PhD student

Supervised by:

Dr Shashi Hirani

Professor Katerina Hilari

Dr Ruth Epstein

We would like to invite you to take part in a research study. Before you decide whether or not you would like to take part, it is important that you understand why the research is being done and what it would involve for you. Please take some time to read the following information carefully and ask the researcher if there is anything you are not clear about or if you would like more information.

What is the purpose of this study?

This study is being undertaken as part of a PhD research project within the School of Health Sciences at City, University of London. This project aims to identify the self-reported voice problems and coping strategies used by Western classical and Carnatic singers. The survey will include questions about:

- Voice problems you may have experienced/are currently experiencing
- Factors affecting your voice
- Managing your voice problems
- Maintaining your vocal health

Please note that you can still take part in this study even if you have never experienced voice problems.

Why have I been invited?

You have been invited to take part in this study because this study focuses on voice problems and coping skills in Western Classical and Carnatic singers and you have been identified as a trained Carnatic/Western Classical singer. The data collected from this interview will not enable us to identify individuals as it is anonymous and does not contain personal details.

What do I have to do?

If you agree to take part in the study, then you will be requested to fill in a consent form and then complete a survey lasting about 20-30 minutes.

Do I have to take part?

Participation in this interview is voluntary, and you can choose not to participate in part or the entire study, should you wish to do so. If you decide to take part, you will be asked to complete a consent form. Once you have completed the survey, you will not be able to withdraw your answers. However, you can choose to leave the survey when you wish. Any answers you have provided to that point will be retained and analysed.

What will happen if I take part?

You can read this Participant Information and then decide to take part or not. If you decide to participate, then you will be invited to complete an online survey lasting about 20-30 minutes. There will be a mixture of questions.

You will be able to part-complete the survey and return within one month to finish it. If you have cookies enabled, use the same device and the same web browser when you return using the anonymous link. Ideally plan a convenient time to complete the survey. We will then analyse the data for publication in a final report. The research study will go on until April 2022.

Data privacy statement

City, University of London is the sponsor and the data controller of this study based in the United Kingdom. This means that we are responsible for looking after your information and using it properly. The legal basis under which your data will be processed is City's public task.

Participants can opt to obtain an update on the survey outcomes by entering their email address

via an optional survey link. Your email address will be recorded separately and cannot be linked to

your survey responses. Only the researcher and supervisors will have access to this information. If you chose to enter your email address, this identifiable information will be held for up to one year after the close of the

study, so that summary results can be shared with you.

Your right to access, change or move your information are limited, as we need to manage your information in a specific way in order for the research to be reliable and accurate. To safeguard your rights, we will use the minimum personal-identifiable information possible (for further information please see https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/lawful-basis-for-processing/public-task/).

What are the possible disadvantages and risks of taking part?

We do not foresee any risks in taking part in an online survey. For some singers, reflecting on their voices may evoke memories of unpleasant past experiences, but we do not expect these to be extreme. If you do, however, feel stressed at any point during the survey, you can choose to leave the survey anytime without giving a reason.

The survey link is anonymous and there are no questions which extract personally identifiable information. There is a time commitment of approximately 20-30 minutes to complete the survey, therefore you should consider whether you have the time available to participate.

What are the possible benefits of taking part?

You will not be financially reimbursed for taking part in the study but taking part in this research will give you an opportunity to reflect on your voice and vocal habits. The results of this project will be beneficial in understanding voice problems and coping strategies in singers and formulating recommendations for maintaining vocal health.

What will happen when the research study stops?

All data will be stored securely as part of City, University of London guidelines for 10 years. The data will be stored anonymously and after the 10-year period, electronic data will be electronically shredded, and hard copies shredded after retrieval from secure archives.

Will my taking part in the study be kept confidential?

The researcher and the supervisors will have access to the information provided. Should any personal data be revealed, it will not be stored or re-used. Anonymised responses will be stored securely at City, university of London for 10 years.

What will happen to the results of the research study?

The survey results will be analysed and will contribute towards the principal researcher's doctoral thesis. These results may be shared via publications in a peer-reviewed journal, conference presentations and dissemination at events involved with singing voices. Participant anonymity will be maintained for all results produced.

Research findings will be written in accordance with the University requirements of a PhD Research Project which will be available to participants upon request.

Who has reviewed the study?

The study has been approved by City, University of London *School of Health Sciences* Research Ethics Committee.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City's complaints procedure. To complain about the study, you need to phone **020 7040 3040.** You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is "A survey of Self-reported voice problems and coping strategies in Western Classical and Carnatic singers."

You can also write to the Secretary at:

Anna Ramberg

Research Integrity Manager

City, University of London, Northampton Square

London, EC1V 0HB

Email: Anna.Ramberg.1@city.ac.uk

Further information and contact details

Researcher: Aparna Ramachandran

aparna.ramachandran@city.ac.uk

07397904847

Supervisor: Shashivadan P. Hirani

Shashi.Hirani.1@city.ac.uk

020 7040 0880

Thank you for taking the time to read this information sheet.

SURVEY CONSENT FORM (QUALTRICS PAGE FOLLOWING PARTICIPANT INFORMATION)

Remember

You may wish to ensure you have 20-30 minutes available to take part in this survey, or you can leave and return if using the same device, browser and with cookies enabled for up to 4 weeks from starting the survey.

Eligibility to participate:

Thank you for agreeing to take part in this survey. Please confirm that:

1. I am a:
    a. Western classical singer
    b. Carnatic singer

2. I have undertaken singing training

3. I am over 18 years of age

	I confirm that I have read and understood the participant information dated **[XXX-Version 1]** for the above study. I have had the opportunity to consider the information and ask questions which have been answered satisfactorily.
	I understand that my participation is voluntary and that I am free to withdraw without giving a reason without being penalised or disadvantaged.
	I understand that once I have completed the survey, I will not be able to withdraw my responses and that, if I leave part-way through the survey I will not be able to withdraw any responses submitted up to that point
	I understand that anonymised quotations may be taken from my responses and included in doctoral thesis, publications and conferences.
	I understand that anonymous data from this survey will be held in City University's data repository and may be used for future secondary analysis in studies that have been given ethical approval.
	I understand that the researcher will not identify me by name in any reports using information obtained from this survey, and that my confidentiality as a participant in this study will remain secure.

	I agree to City recording and processing this information about me. I understand that this information will be used only for the purpose(s) explained in the participant information and my consent is conditional on City complying with its duties and obligations under the General Data Protection Regulation (GDPR).
	I would like to be informed of the results of this survey and understand that I can choose for my email address to be collected and retained separately for this purpose.
	I agree to take part in the above study.

ETHICS APPROVAL LETTER FOR SURVEY

Dear Aparna

Reference: ETH2122-0107

Project title: A survey of self-reported voice problems and coping styles in Western Classical and Carnatic singers

Start date: 9 Nov 2021

End date: 29 Apr 2022

I am writing to you to confirm that the research proposal detailed above has been granted formal approval from the Health Services Research & Management Proportionate Review Committee. The Committee's response is based on the protocol described in the application form and supporting documentation. Approval has been given for the submitted application only and the research must be conducted accordingly. You are now free to start recruitment.

The approval was given with the following conditions:

- No Conditions

Please ensure that you are familiar with City's Framework for Good Practice in Research and any appropriate Departmental/School guidelines, as well as applicable external relevant policies.

Please note the following:

Project amendments/extension

You will need to submit an amendment or request an extension if you wish to make any of the following changes to your research project:

- Change or add a new category of participants;
- Change or add researchers involved in the project, including PI and supervisor;
- Change to the sponsorship/collaboration;
- Add a new or change a territory for international projects;

- Change the procedures undertaken by participants, including any change relating to the safety or physical or mental integrity of research participants, or to the risk/benefit assessment for the project or collecting additional types of data from research participants;
- Change the design and/or methodology of the study, including changing or adding a new research method and/or research instrument;
- Change project documentation such as protocol, participant information sheets, consent forms, questionnaires, letters of invitation, information sheets for relatives or carers;
- Change to the insurance or indemnity arrangements for the project;
- Change the end date of the project.

Adverse events or untoward incidents

You will need to submit an Adverse Events or Untoward Incidents report in the event of any of the following:

a) Adverse events

b) Breaches of confidentiality

c) Safeguarding issues relating to children or vulnerable adults

d) Incidents that affect the personal safety of a participant or researcher

Issues a) and b) should be reported as soon as possible and no later than five days after the event. Issues c) and d) should be reported immediately. Where appropriate, the researcher should also report adverse events to other relevant institutions, such as the police or social services.

Should you have any further queries relating to this matter, please do not hesitate to contact me. On behalf of the Health Services Research & Management Proportionate Review Committee, I do hope that the project meets with success.

Kind regards

[redacted]

Appendix 5.3: The survey instrument administered to the participants as displayed in Qualtrics

Survey Flow

Block: Information for participants and consent (3 Questions)
Standard: DEMOGRAPHIC INFORMATION-BASIC (5 Questions)
Standard: SINGING HISTORY (12 Questions)
Standard: TRAINING HISTORY (4 Questions)
Standard: PERCEPTION OF OWN VOICE (4 Questions)
Standard: VOCAL PROBLEMS (13 Questions)
Standard: IMPACT OF VOICE PROBLEM(S)-THE SINGING VOICE HANDICAP INDEX (6 Questions)
Standard: Block 16 (1 Question)
Standard: COPING WITH VOICE PROBLEMS-THE VOICE DISABILITY COPING QUESTIONNAIRE (6 Questions)
Standard: ILLNESS PERCEPTION (10 Questions)
Standard: VOCAL BEHAVIOURS (4 Questions)
Standard: FACTORS AFFECTING VOICE (18 Questions)
Standard: BELIEFS AND RESPONSES (1 Question)
Standard: MAINTAINING VOCAL HEALTH (1 Question)
Standard: MEDICAL HISTORY (8 Questions)
Standard: DEMOGRAPHIC INFORMATION 1-FAMILY SETUP (4 Questions)
Standard: CONTACT DETAILS (1 Question)

Q1 **THANK YOU SO MUCH FOR CONSIDERING TO TAKE PART IN THIS SURVEY.**

PLEASE CLICK ON THE LINK BELOW TO READ IMPORTANT INFORMATION PERTAINING TO THE STUDY AND YOUR PARTICIPATION. YOU MAY DOWNLOAD A COPY OF THE DOCUMENT FOR YOUR RECORDS.

Participant information sheet online survey version 3

- ○ I have read the participant information sheet and I am happy to proceed further (1)

Q2 Survey Consent (Qualtrics page following participant information)

Eligibility to participate: Thank you for agreeing to take part in this survey. Please select all fields to be eligible to take part in the survey.

N.B. If all fields are not selected, then you will not meet the eligibility criteria for the survey and will be taken to the end of the survey.

- ☐ I am a Western classical or Carnatic singer (1)
- ☐ I have undertaken singing training for a minimum of 1 year (3)
- ☐ I am over 18 years of age (4)

Skip To: End of Survey If Q2 != 3

Skip To: End of Survey If Q2 != 4

Skip To: End of Survey If Q2 != 1

Q3 PLEASE CLICK ON THE LINK BELOW TO VIEW THE CONSENT FORM. YOU MAY DOWNLOAD THIS DOCUMENT FOR YOUR RECORDS.

Informed consent online survey version 3

Having read the conditions on the consent form and agreeing to them:-

- ○ I give consent for participating in the survey (1)
- ○ I do not wish to participate in the survey (2)

Skip To: End of Survey If Q3 = 2

Q4 We would like to start by asking you a few demographic questions.

Q5 Which year were you born?

_____

Q6 What was your gender at birth?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Q7 What is your nationality?

_____

Q8 What is your ethnicity?

- ○ White (7)
- ○ Asian (8)
- ○ Black (9)
- ○ Other (10)

Q9 The next set of questions will ask you about your singing history.

Q10 Are you a full-time singer?

- ○ Yes (1)
- ○ No (please specify any other work commitments (2)

_____

Display This Question:

If Q10 = 2

Q11 Approximately, what percentage of your time do you work as a singer?

_____

Q12 Which of the following is your primary singing genre?

- ○ Western Classical/Classical choir (1)
- ○ Carnatic (2)

Q13 Please select any other genres you may be associated with (Tick all that apply)

- ☐ Jazz (1)
- ☐ Musical theatre (2)
- ☐ Indian light/film music (3)
- ☐ Contemporary choir (4)
- ☐ Other (please specify) (5) _____

Display This Question:

If Q12 = 1

Q14 What is your voice type?

- ○ Contralto (1)
- ○ Alto (2)
- ○ Mezzo-Soprano (4)

- ○ Baritone (5)
- ○ Bass (6)
- ○ Tenor (7)
- ○ Counter-tenor (8)

Q15 What is your performance level for your primary genre?

- ☐ Amateur singer (1)
- ☐ Semi-professional singer (2)
- ☐ Professional singer (3)
- ☐ Singing teacher (4)

Display This Question:

If Q15 = 4

Q16 How many hours a week do you teach singing?

_____

Q17 How many years have you been singing?

_____

Q18 Which of the following performance types are you associated with? (please tick all that apply)

- ☐ Solo singing (1)
- ☐ Group singing (2)
- ☐ Duet (3)

Q19 On average, how many hours do you perform each month? (Please answer this question reflecting from your performance frequencies prior to COVID-19)

_____

Q20 On average, how many hours do you practice singing each week?

_____

Q21 The next set of questions are pertaining to your singing training

Q22 Please select the genre(s) you have received training in (please tick all that apply)

- ☐ Western Classical (1)
- ☐ Carnatic (2)
- ☐ Other (please specify (3) _____

Q23 At what age did you start training? (if you have had training in more than one genre, please specify starting age for all)

_____

Q24 For how long have you had training? (if you have had training in more than one genre, please specify training duration for all)

_____

Q25 The next set of questions look at how you perceive your own voice.

Q26 Please select the attributes which you think best describe your voice (please tick all that apply)

- ☐ Big/Loud (1)
- ☐ Open/open throated (2)
- ☐ Warm (3)
- ☐ Silvery (4)
- ☐ Gold (5)
- ☐ Steady (6)
- ☐ Solid (7)
- ☐ Expressive (8)
- ☐ Wide-ranged (9)
- ☐ Sweet (10)
- ☐ Melodious (11)
- ☐ Nasal (12)
- ☐ Husky (13)
- ☐ Other (please specify) (14) _____

Q27 Please select descriptors others (audience, singing teachers etc) have used to describe your voice (please tick all that apply)

- ☐ Big/Loud (1)
- ☐ Open/open throated (2)
- ☐ Warm (3)
- ☐ Silvery (4)
- ☐ Gold (5)
- ☐ Steady (6)
- ☐ Solid (7)
- ☐ Expressive (8)
- ☐ Wide-ranged (9)
- ☐ Sweet (10)
- ☐ Melodious (11)
- ☐ Nasal (12)
- ☐ Husky (13)
- ☐ Other (please specify) (14) _____

Q28 Do you like your own voice?

- ○ No (please describe what you do not like about your voice in the box below) (1)

_____

- ○ Yes (please describe what you like about your voice in the box below) (2)

_____

Q29 Please answer the following questions pertaining to vocal problems.

Q30 Do you currently have any vocal problems which may interfere with your singing?

- ○ Yes (1)
- ○ No (2)

Q31 Have you had any vocal problems in the past which may have interfered with your singing? (Please reflect across your singing career and identify if you have had a situation where voice may not have functioned as it normally does-this is defined as a voice problem for the purpose of this study)

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Q31 = 1

Or Q30 = 1

Q32 When did you first notice the problem? (if you have had multiple episodes of voice problems, then please reflect on your most recent episode)

_____

Display This Question:

If Q31 = 1

Or Q30 = 1

Q33 How long have you had the voice problem? (if you have had multiple episodes of voice problems, then please reflect on your most recent episode)

_____

Display This Question:

If Q31 = 1

Or Q30 = 1

Q34 Did your voice problem happen (if you have had multiple episodes of voice problems, then please reflect on your most recent episode)

- ○ Suddenly? (1)
- ○ Gradually? (please mention the time period over which it got worse) (2)

_____

Display This Question:

If Q31 = 1

Or Q31 = 1

Q35 Have you been diagnosed with any vocal condition by a speech therapist or ENT practitioner? (if yes, please mention diagnosis in box provided)

- ○ Yes (1) _____
- ○ No (2)

Display This Question:

If Q31 = 1

Or Q31 = 1

Q36 Has the severity of the voice problem

- ○ Remained the same (1)
- ○ Progressively worsened (2)
- ○ Reduced over time (3)
- ○ Can't say (4)

Q37 Which of the following vocal problems have you experienced/are you currently experiencing? Please reflect across your singing career and answer this section by selecting all that apply. (Please indicate the frequency with which they occur/occurred and the severity of the symptom/sensation by clicking on the circle in the appropriate column)

	Frequency of sensation/symptom				Severity of sensation/symptom			
	Never (1)	Sometimes (2)	Often (3)	Always (4)	None (1)	Mild (2)	Moderate (3)	Severe (4)
Harshness (1)	○	○	○	○	○	○	○	○
Hoarseness (2)	○	○	○	○	○	○	○	○
Breathiness (3)	○	○	○	○	○	○	○	○
Huskiness (4)	○	○	○	○	○	○	○	○
Reaching higher notes (5)	○	○	○	○	○	○	○	○
Reaching lower notes (6)	○	○	○	○	○	○	○	○

Q38 Which of the following vocal problems have you experienced/are you currently experiencing? Please reflect across your singing career and answer this section by selecting all that apply. (Please indicate the frequency with which they occur/occurred and the severity of the symptom/sensation by clicking on the circle in the appropriate column)

	Frequency of sensation/symptom				Severity of sensation/symptom			
	Never (1)	Sometimes (2)	Often (3)	Always (4)	None (1)	Mild (2)	Moderate (3)	Severe (4)
Overall reduced pitch range (1)	○	○	○	○	○	○	○	○
Singing softly (2)	○	○	○	○	○	○	○	○
Singing loudly (3)	○	○	○	○	○	○	○	○
Lack of vocal power (4)	○	○	○	○	○	○	○	○
Vocal fatigue (5)	○	○	○	○	○	○	○	○
Throat pain (6)	○	○	○	○	○	○	○	○

Q39 Which of the following vocal problems have you experienced/are you currently experiencing? Please reflect across your singing career and answer this section by selecting all that apply. (Please indicate the frequency with which they occur/occurred and the severity of the symptom/sensation by clicking on the circle in the appropriate column)

	Frequency of sensation/symptom				Severity of sensation/symptom			
	Never (1)	Sometimes (2)	Often (3)	Always (4)	None (1)	Mild (2)	Moderate (3)	Severe (4)
Throat tightness (1)	○	○	○	○	○	○	○	○
Throat dryness (2)	○	○	○	○	○	○	○	○
Throat itchiness (3)	○	○	○	○	○	○	○	○
Vocal strain/effortful singing (4)	○	○	○	○	○	○	○	○

Lack of control over voice/unsteady voice/wobble (5)	○	○	○	○	○	○	○	○
Problems sustaining notes (6)	○	○	○	○	○	○	○	○

Q40 Which of the following vocal problems have you experienced/are you currently experiencing? Please reflect across your singing career and answer this section by selecting all that apply. (Please indicate the frequency with which they occur/occurred and the severity of the symptom/sensation by clicking on the circle in the appropriate column)

	Frequency of sensation/symptom				Severity of sensation/symptom			
	Never (1)	Sometimes (2)	Often (3)	Always (4)	None (1)	Mild (2)	Moderate (3)	Severe (4)
Voice breaks (1)	○	○	○	○	○	○	○	○
Lack of flexibility (2)	○	○	○	○	○	○	○	○
Problems with resonance (3)	○	○	○	○	○	○	○	○
Problems with transition between registers/passaggio (moving from lower pitch to higher pitch or vice versa) (4)	○	○	○	○	○	○	○	○
Lack of breath support/breath control (5)	○	○	○	○	○	○	○	○

Q41 Which of the following vocal problems have you experienced/are you currently experiencing? Please reflect across your singing career and answer this section by selecting all that apply. (Please indicate how frequently they occur/occurred and the severity of the symptom/sensation by clicking on the circle in the appropriate column)

	Frequency of sensation/symptom				Severity of the sensation/symptom			
	Never (1)	Sometimes (2)	Often (3)	Always (4)	None (1)	Mild (2)	Moderate (3)	Severe (4)
Loss of voice (1)	○	○	○	○	○	○	○	○
Frequent coughing (2)	○	○	○	○	○	○	○	○
Frequent throat clearing (3)	○	○	○	○	○	○	○	○
Loss of form (4)	○	○	○	○	○	○	○	○
Difficulty with vocal ornaments (5)	○	○	○	○	○	○	○	○
Other (please specify) (6)	○	○	○	○	○	○	○	○

Q42 These are statements that many people have used to describe their singing and the effects of their singing on their lives. Select the response that indicates how frequently you have had the same experience in the last month. Please record your response for all statements

	Never (0)	Almost never (1)	Sometimes (2)	Almost always (3)	Always (4)
It takes a lot of effort to sing. (1)	○	○	○	○	○
My voice cracks and breaks. (2)	○	○	○	○	○
I am frustrated by my singing (3)	○	○	○	○	○

People ask “What is wrong with your voice?” when I sing. (4)	○	○	○	○	○
My ability to sing varies day to day. (5)	○	○	○	○	○
My voice “gives out” on me while I am singing. (give out refers to your voice stopping to function satisfactorily) (6)	○	○	○	○	○

Q43 These are statements that many people have used to describe their singing and the effects of their singing on their lives. Select the response that indicates how frequently you have had the same experience in the last month. Please record your response for all statements

	Never (0)	Almost never (1)	Sometimes (2)	Almost always (3)	Always (4)
My singing voice upsets me (1)	○	○	○	○	○
My singing problems make me not want to sing/perform. (2)	○	○	○	○	○
I am embarrassed by my singing (3)	○	○	○	○	○
I am unable to use my “high voice.” (4)	○	○	○	○	○
I get nervous before I sing because of my singing problems. (5)	○	○	○	○	○
My speaking voice is not normal. (6)	○	○	○	○	○

Q44 These are statements that many people have used to describe their singing and the effects of their singing on their lives. Select the response that indicates how frequently you have had the same experience in the last month. Please record your response for all statements

	Never (0)	Almost never (1)	Sometimes (2)	Almost always (3)	Always (4)
My throat is dry when I sing. (1)	○	○	○	○	○
I've had to eliminate certain songs from my singing/performances. (2)	○	○	○	○	○
I have no confidence in my singing voice. (3)	○	○	○	○	○
My singing voice is never normal. (4)	○	○	○	○	○
I have trouble making my voice do what I want it to. (5)	○	○	○	○	○
I have to "push it" to produce my voice when singing. (6)	○	○	○	○	○

Q45 These are statements that many people have used to describe their singing and the effects of their singing on their lives. Select the response that indicates how frequently you have had the same experience in the last month. Please record your response for all statements

	Never (0)	Almost never (1)	Sometimes (2)	Almost always (3)	Always (4)
I have trouble controlling the breathiness in my voice. (1)	○	○	○	○	○
I have trouble controlling the	○	○	○	○	○

raspiness in my voice. (2)					
I have trouble singing loudly. (3)	○	○	○	○	○
I have difficulty staying on pitch when I sing. (4)	○	○	○	○	○
I feel anxious about my singing. (5)	○	○	○	○	○
My singing makes me feel incompetent. (6)	○	○	○	○	○

Q46 These are statements that many people have used to describe their singing and the effects of their singing on their lives. Select the response that indicates how frequently you have had the same experience in the last month. Please record your response for all statements

	Never (0)	Almost never (1)	Sometimes (2)	Almost always (3)	Always (4)
My singing sounds forced. (1)	○	○	○	○	○
My speaking voice is hoarse after I sing. (2)	○	○	○	○	○
My voice quality is inconsistent. (3)	○	○	○	○	○
My singing voice makes it difficult for the audience to hear me. (4)	○	○	○	○	○

My singing makes me feel handicapped. (5)	○	○	○	○	○
My singing voice tires easily. (6)	○	○	○	○	○

Q47 These are statements that many people have used to describe their singing and the effects of their singing on their lives. Select the response that indicates how frequently you have had the same experience in the last month. Please record your response for all statements

	Never (0)	Almost never (1)	Sometimes (2)	Almost always (3)	Always (4)
I feel pain, tickling, or choking when I sing. (1)	○	○	○	○	○
I am unsure of what will come out when I sing. (2)	○	○	○	○	○
I feel something is missing in my life because of my inability to sing. (3)	○	○	○	○	○
I am worried my singing problems will cause me to lose money. (4)	○	○	○	○	○
I feel left out of the music scene because of my voice. (5)	○	○	○	○	○
I have to cancel performances, singing engagements, rehearsals, or practices because of my singing. (6)	○	○	○	○	○

Q48 Please continue until the end of the survey. Not many questions left..

Q49 The following statements indicate how people may respond when they have a problem with their voice. There are lots of ways to deal with these situations and circumstances. Obviously different events bring out different responses, but think what you would usually do when the condition of your voice (speaking or singing voice) is unsatisfactory. Please remember there are no right or wrong answers and record your responses for all statements.

	Never (1)	Almost never (2)	Sometimes (3)	Quite often (4)	Very often (5)	Always (6)
It helps me to cope with my voice problem if other people are sympathetic. (1)	○	○	○	○	○	○
I find it easier to cope with my voice problem by expressing my feelings outwardly. (2)	○	○	○	○	○	○
I find talking with friends and family about my voice problem helpful. (3)	○	○	○	○	○	○
I keep any worries I may have about my voice problem to myself. (4)	○	○	○	○	○	○
Having a voice problem has helped me to find some important truth about my life. (5)	○	○	○	○	○	○

Q50 The following statements indicate how people may respond when they have a problem with their voice. There are lots of ways to deal with these situations and circumstances. Obviously different events bring out different responses, but think what you would usually do when the condition of your voice (speaking or singing voice) is unsatisfactory. Please remember there are no right or wrong answers and record your responses for all statements.

	Never (1)	Almost never (2)	Sometimes (3)	Quite often (4)	Very often (5)	Always (6)
I find it easier to cope with my voice problem if I ask the doctor questions about. (1)	○	○	○	○	○	○
When my voice gets bad, I find myself taking it out on others around me. (2)	○	○	○	○	○	○
I find religion and praying to God help me to cope with my voice problem. (3)	○	○	○	○	○	○
I try to avoid situations where my voice problem would become evident. (4)	○	○	○	○	○	○
I find it easier to cope with my voice problem by avoiding being with people in general. (5)	○	○	○	○	○	○

Q51 The following statements indicate how people may respond when they have a problem with their voice. There are lots of ways to deal with these situations and circumstances. Obviously different events bring out different responses but think what you would usually do when the condition of your voice (speaking or singing voice) is unsatisfactory. Please remember there are no right or wrong answers and record your responses for all statements.

	Never (1)	Almost never (2)	Sometimes (3)	Quite often (4)	Very often (5)	Always (6)
I find it easier to cope with my voice problem by telling myself not	○	○	○	○	○	○

to think about it. (1)						
I take the view that there is little I can do about my voice problem. (2)	○	○	○	○	○	○
I find it easier to cope with my voice problem wishing that it would go away or somehow be over with. (3)	○	○	○	○	○	○
I ask people to help me with those things I cannot manage because of my voice problem. (4)	○	○	○	○	○	○
I find myself wishing that I never had a voice problem. (5)	○	○	○	○	○	○

Q52 The following statements indicate how people may respond when they have a problem with their voice. There are lots of ways to deal with these situations and circumstances. Obviously different events bring out different responses but think what you would usually do when the condition of your voice (speaking or singing voice) is unsatisfactory. Please remember there are no right or wrong answers and record your responses for all statements.

	Never (1)	Almost never (2)	Sometimes (3)	Quite often (4)	Very often (5)	Always (6)
I find it easier to live with my voice problem, if I do not use my voice. (1)	○	○	○	○	○	○
I try to become involved in as many physical activities as possible to take my mind off my voice problem. (2)	○	○	○	○	○	○
I try to find as much information as possible about my voice problem. (3)	○	○	○	○	○	○
I find it easier to cope with my voice problem by finding out as much about it as I can. (4)	○	○	○	○	○	○
I find it easy to cope with my voice problem when I compare myself to other people who have worse health problems. (5)	○	○	○	○	○	○

Q53 The following statements indicate how people may respond when they have a problem with their voice. There are lots of ways to deal with these situations and circumstances. Obviously different events bring out different responses but think what you would usually do when the condition of your voice (speaking or singing voice) is unsatisfactory. Please remember there are no right or wrong answers and record your responses for all statements.

	Never (1)	Almost never (2)	Sometimes (3)	Quite often (4)	Very often (5)	Always (6)
I find it easier to cope with my voice problem by joking about it. (1)	○	○	○	○	○	○
I cope better with my voice problems by trying to accept it, since nothing can be done. (2)	○	○	○	○	○	○
I keep my frustrations to myself, so few of my friends know I am frustrated. (3)	○	○	○	○	○	○
I try to convince myself that my voice problem is not really that disabling. (4)	○	○	○	○	○	○

Having a voice problem has helped me develop into a better person. (5)	○	○	○	○	○	○

Q54 The following statements indicate how people may respond when they have a problem with their voice. There are lots of ways to deal with these situations and circumstances. Obviously different events bring out different responses but think what you would usually do when the condition of your voice (speaking or singing voice) is unsatisfactory. Please remember there are no right or wrong answers and record your responses for all statements.

	Never (1)	Almost never (2)	Sometimes (3)	Quite often (4)	Very often (5)	Always (6)
I ignore my voice problem by looking at only the good things in life (1)	○	○	○	○	○	○
Resting my voice at times, helps me cope with my voice problem. (2)	○	○	○	○	○	○
I find it easier to cope with my voice problems by involving myself in activities unrelated to singing (eg: playing a musical	○	○	○	○	○	○

instrument) (3)						
I tend to resort to home remedies when I have a voice problem (4)	○	○	○	○	○	○
I find it easier to cope with my voice problem if I make myself think that I do not have a problem (5)	○	○	○	○	○	○

Q55 The following statements relate to how you perceive your voice problem. Please circle the number that best corresponds to your views.

Q56 How much does your voice problem(s)affect your life?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)

- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q57 How long do you think your voice problem(s)will continue?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q58 How much control do you feel you have over your voice problem(s)?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)

- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q59 How much do you think your treatment can help your voice problem(s)?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q60 How much do you experience symptoms from your voice problem(s)?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q61 How concerned are you about your voice problem(s)?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)

- ○ 9 (9)
- ○ 10 (10)

Q62 How well do you feel you understand your problem(s)?

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)
- ○ 10 (10)

Q63 How much does your problem(s) affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)

- ○ 0 (0)
- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)

○ 4 (4)

○ 5 (5)

○ 6 (6)

○ 7 (7)

○ 8 (8)

○ 9 (9)

○ 10 (10)

Q64 Please list in rank-order ***the three most important factors*** that you believe caused your illness. The most important causes for me:-

_____

_____

_____

Q65 The following questions are related to vocal behaviours

Q66 Please select the appropriate column to indicate the frequency of occurrence of the following vocal behaviours

	Never (1)	Occasionally (2)	Sometimes (3)	Often (4)
Do you speak/sing loudly? (1)	○	○	○	○
Do you sing or speak excessively (singing or speaking for too long too often)? (2)	○	○	○	○
Do you clear your throat? (3)	○	○	○	○

Do you sing when you are unwell? (4)	○	○	○	○
Do you clench your jaw/teeth while singing? (5)	○	○	○	○
Do you use amplification while singing? (6)	○	○	○	○

Q67 Do you regularly warm up and cool down your voice before and after singing?

- ○ Never (1)
- ○ Occasionally (2)
- ○ Sometimes (3)
- ○ Often (4)

Q68 Which of the following warm up exercises do you use?

- ☐ Pitch glides (1)
- ☐ Lip trills (2)
- ☐ Tongue trills (3)
- ☐ Humming (4)
- ☐ Sirens (5)
- ☐ Akaara Saadhakam (6)
- ☐ Jantai vaisai, dhattu varisai, saralai varisai (7)
- ☐ Other (8) _____

Q69 The next set of questions are pertaining to factors which could potentially impact your voice. Please read the questions and record your responses.

Q70 How many hours of sleep do you get on average, each night?

_____

Q71 Do you regularly consume any of the following?

	Never (1)	Rarely (2)	Occasionally (3)	Frequently (4)
Alcohol (1)	○	○	○	○
Caffeine (2)	○	○	○	○
Tobacco (3)	○	○	○	○
Spicy foods (4)	○	○	○	○
Oily foods (5)	○	○	○	○
Cold foods/refrigerated items (6)	○	○	○	○
Dairy products (7)	○	○	○	○

Q72 How often do you take physical exercise (Please mention duration in text box)

- ○ Everyday (1) _____
- ○ 4-6 times a week (2) _____
- ○ 2-4 times a week (3) _____
- ○ Infrequently (4)

Q73 Do you have a healthy body weight?

- Yes (1)
- No (2)
- Not sure (3)
- Prefer not to say (4)

Q74 How much water do you consume each day?

- Less than 2 glasses (1)
- Between 2-4 glasses (2)
- Between 4-8 glasses (3)
- More than 8 glasses (4)

Q75 Do you sip water on a regular basis during singing?

- Never (1)
- Occasionally (2)
- Sometimes (3)
- Often (4)

Display This Question:

If Q6 = 2

Q76 Do you suffer from Pre-Menstrual syndrome (PMS)?

- Never (1)
- Sometimes (2)
- Most of the time (3)
- Always (4)

Display This Question:

If Q6 = 2

Q77 Does PMS affect your voice or singing?

- Not at all (1)
- A little (2)
- A moderate amount (3)
- A lot (4)

Display This Question:

If Q6 = 2

Q78 Does menstruation affect your voice or singing?

- Not at all (1)
- A little (2)
- A moderate amount (3)
- A lot (4)

Q79 Are you taking oral contraceptives?

- ○ No (1)
- ○ Yes (2)

Display This Question:

If Q6 = 2

Q80 Are you currently experiencing menopause/have you experienced menopause in the past?

- ○ No (1)
- ○ Yes (2)

Display This Question:

If Q6 = 2

And Q80 = 2

Q81 Is/did menopause affect(ing) your voice or singing? (please describe how, in the text box below)

- ○ Not at all (1)
- ○ A little (2)
- ○ A moderate amount (3)
- ○ A lot (4) _____

Q82 How frequently do you suffer from colds/allergies?

- ○ Rarely (1)
- ○ Occasionally (2)
- ○ Sometimes (3)
- ○ Often (4)

Skip To: Q85 If Q83 = 1

Q84 In your opinion, what are the main factors contributing to your (singing) work stress (please tick all that apply)?

- ☐ Expectations from employers (sponsors, directors) (1)
- ☐ Financial factors (2)
- ☐ Insecurities/uncertainties surrounding getting more/future work (3)
- ☐ Problems with your voice (4)
- ☐ Lack of rest/breaks (5)
- ☐ Matching expectations of audience/significant others especially while performing live (6)
- ☐ Poor acoustics/amplification while singing (7)
- ☐ Unable to refuse work/opportunities (8)
- ☐ Managing personal commitments (eg: family) along with singing commitments (9)

☐ Competition/peer pressure (10)

☐ Lack of fairness in opportunities (eg: less talented singers getting more opportunities, favoritism etc) (11)

Q85 Do you have performance anxiety?

○ None at all (1)

○ A little (2)

○ A moderate amount (3)

○ A lot (4)

Q86 Do you think you have a positive attitude towards your voice and singing?

○ Definitely not (1)

○ Probably not (2)

○ Might or might not (3)

○ Probably yes (4)

○ Definitely yes (5)

Q87 In your opinion, which of the following factors have a ***NEGATIVE*** impact on the voice or singing performance? (please tick all that apply)

- ☐ Inadequate sleep (1)
- ☐ Alcohol consumption (2)
- ☐ Tobacco consumption (28)
- ☐ Caffeine consumption (3)
- ☐ Consuming dairy products (4)
- ☐ Consuming spicy foods (5)
- ☐ Consuming oily foods (27)
- ☐ Consuming cold foods/refrigerated items (6)
- ☐ Unhealthy body weight (7)
- ☐ Lack of physical exercise (8)
- ☐ Frequent travelling (9)
- ☐ Pre-menstrual Syndrome (10)
- ☐ Menstruation (11)
- ☐ Menopause (12)
- ☐ Oral contraceptives (13)
- ☐ Frequent colds/allergies (14)
- ☐ Medications (15)

- [ ] Stress (16)
- [ ] Performance anxiety (17)
- [ ] Cross-over singing (singing multiple genres) (18)
- [ ] Over singing/excessive speaking (19)
- [ ] Lack of voice rest (20)
- [ ] Negative attitude towards own voice and singing (21)
- [ ] Lack of warm up/cool down practices (22)
- [ ] Lack of regular vocal practice/saadhakam (23)
- [ ] Lack of faith in god (24)
- [ ] Poor acoustics in concert venues/lack of proper amplification (25)
- [ ] Other (please specify) (26) _____

Q88 What practices do you follow to maintain your vocal health?

_____

Q89 Please answer the following questions related to health and travel

Q90 a) Have you had/are you currently suffering from any medical condition which could impact your voice?

- ○ No (1)
- ○ Yes (please specify) (2) _____

Q91 b) Have you had any surgery which could have an impact on your voice?

- ○ No (1)
- ○ Yes (please specify) (2) _____

Q92 Has COVID-19 had an impact on your voice?

- ○ No (1)
- ○ Maybe (please specify) (2) _____
- ○ Yes (please specify) (3) _____

Q93 Are you currently taking any medications which impact your voice?

- ○ No (1)
- ○ Yes (please list the medications in the box below) (2)

_____

Q94 Do you travel to give performances? (Please answer this question reflecting from your travel history prior to COVID-19)

- ○ No (1)
- ○ Yes (2)

Display This Question:

If Q94 = 2

Q95 How often do you travel in a year? (Please answer this question reflecting from your travel history prior to COVID-19)

- ○ < 5 times (1)
- ○ 5-10 times (2)
- ○ 10-20 times (3)
- ○ >20 times (4)

Display This Question:

If Q94 = 2

Q96 What modes of travel do you use?

- ☐ Airplane (1)
- ☐ Car (2)
- ☐ Train (3)
- ☐ Other (Please specify) (4) _____

Q97 Please answer the final set of questions about you

Q98 Are you

- ○ Married/in a relationship (1)
- ○ Widowed (2)
- ○ Divorced (3)
- ○ Single (4)
- ○ Prefer not to say (5)

Q99 Do you have caring responsibilities for any of the following groups? (if yes, please mention how many in each category)

☐ Babies and very young children (up to 5 years of age) (1)
_____

☐ Young children (up to 12 years of age) (2)
_____

☐ Teenage children (Up to 18 years of age) (3)
_____

☐ Other dependents (eg., people with disabilities, aged members etc) (4)
_____

Q100 Please indicate your highest level of education

○ School (1)

○ College/Pre university or equivalent (2)

○ University graduate (3)

○ Post graduate or higher (4)

Q101 Please click on the link below to enter your contact details to receive a summary of the results of the survey and/or to participate in a lucky draw.

○ https://cityunilondon.eu.qualtrics.com/jfe/form/SV_08kIlQlWO9DMlLg (1)

○ I do not wish to provide my contact details (2)

Appendix 6.1: Description of missing values for all variables in the survey

Missing values at item level

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
Severity of the sensation/symptom - Loss of form	89	53.9%	76	1.76	0.728
Severity of the sensation/symptom - Loss of voice	85	51.5%	80	2.04	0.999
Severity of sensation/symptom - Problems with resonance	84	50.9%	81	1.89	0.775
Severity of the sensation/symptom - Difficulty with vocal ornaments	83	50.3%	82	1.88	0.792
Severity of sensation/symptom - Singing loudly	82	49.7%	83	2.08	0.913
Severity of sensation/symptom - Harshness	82	49.7%	83	1.80	0.793
Severity of the sensation/symptom - Frequent coughing	82	49.7%	83	1.95	0.909
Severity of sensation/symptom - Throat itchiness	79	47.9%	86	1.72	0.890
Severity of sensation/symptom - Huskiness	79	47.9%	86	1.84	0.879
Severity of sensation/symptom - Lack of flexibility	78	47.3%	87	2.14	0.750
Severity of sensation/symptom - Singing softly	77	46.7%	88	2.00	0.897
Severity of sensation/symptom - Reaching lower notes	76	46.1%	89	2.10	0.954
Severity of sensation/symptom - Voice breaks	73	44.2%	92	2.15	0.694
Severity of sensation/symptom - Breathiness	73	44.2%	92	2.18	0.925
Severity of sensation/symptom - Problems with transition between registers/passaggio	72	43.6%	93	2.17	0.928
Severity of sensation/symptom - Hoarseness	72	43.6%	93	2.09	0.843
Severity of sensation/symptom - Throat dryness	71	43.0%	94	2.07	0.722
Severity of the sensation/symptom - Frequent throat clearing	71	43.0%	94	2.11	0.861
Severity of sensation/symptom - Throat pain	70	42.4%	95	2.12	0.898
Severity of sensation/symptom - Throat tightness	69	41.8%	96	2.16	0.825
Severity of sensation/symptom - Overall reduced pitch range	69	41.8%	96	2.24	0.880
Severity of sensation/symptom - Lack of control over voice/unsteady voice/wobble	68	41.2%	97	2.03	0.859
Severity of sensation/symptom - Problems sustaining notes	67	40.6%	98	2.13	0.893
Severity of sensation/symptom - Lack of vocal power	67	40.6%	98	2.23	0.939
Severity of sensation/symptom - Lack of breath support/breath control	64	38.8%	101	2.23	0.937
Severity of sensation/symptom - Vocal strain/effortful singing	64	38.8%	101	2.50	0.867

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
Severity of sensation/symptom - Reaching higher notes	60	36.4%	105	2.57	0.897
Severity of sensation/symptom - Vocal fatigue	59	35.8%	106	2.56	0.927
Has COVID-19 had an impact on your voice? -	59	35.8%	106	1.36	0.665
VDCQ_A2_I tend to resort to home remedies when I have a voice problem	58	35.2%	107	3.79	1.606
VDCQ_A1_I find it easier to cope with my voice problems by involving myself in activities unrelated to singing (eg: playing a musical instrument)	58	35.2%	107	3.14	1.674
Are you currently taking any medications which impact your voice? -	58	35.2%	107	1.07	0.264
VDCQ_A3_I find it easier to cope with my voice problem if I make myself think that I do not have a problem	57	34.5%	108	2.65	1.625
VDCQ_S27_Resting my voice at times, helps me cope with my voice problem.	57	34.5%	108	4.09	1.437
VDCQ_S26_I ignore my voice problem by looking at only the good things in life	57	34.5%	108	2.56	1.530
a) Have you had/are you currently suffering from any medical condition which could impact your voice? -	57	34.5%	108	1.19	0.398
b) Have you had any surgery which could have an impact on your voice? -	57	34.5%	108	1.09	0.291
Do you travel to give performances? (Please answer this question reflecting from your travel history prior to COVID-19)	57	34.5%	108	1.55	0.500
Are you	57	34.5%	108	1.81	1.363
VDCQ_S25_Having a voice problem has helped me develop into a better person.	56	33.9%	109	2.88	1.720
VB_Do you use amplification while singing?	56	33.9%	109	1.98	0.991
VB_Do you clench your jaw/teeth while singing?	56	33.9%	109	1.44	0.713
VB_Do you clear your throat?	56	33.9%	109	2.50	0.909
Do you experience work related stress in your singing job(s)?	56	33.9%	109	2.14	0.967
How frequently do you suffer from colds/allergies?	56	33.9%	109	2.22	1.003
Do you have performance anxiety?	56	33.9%	109	2.19	0.876
Do you think you have a positive attitude towards your voice and singing?	56	33.9%	109	4.10	1.027
Please indicate your highest level of education	56	33.9%	109	3.57	0.644
IPQ_S8_How much does your problem(s) affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)	55	33.3%	110	4.86	3.210
IPQ_S8_How much does your problem(s) affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?) - Group	55	33.3%	110	1.48	0.726
IPQ_S7_How well do you feel you understand your problem(s)?	55	33.3%	110	6.97	2.960

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
IPQ_S7_How well do you feel you understand your problem(s)? - Group	55	33.3%	110	2.06	0.870
IPQ_S4_How much do you think your treatment can help your voice problem(s)?	55	33.3%	110	6.45	2.879
IPQ_S4_How much do you think your treatment can help your voice problem(s)? - Group	55	33.3%	110	1.84	0.862
Do you regularly warm up and cool down your voice before and after singing?	55	33.3%	110	2.92	1.042
VB_Do you sing when you are unwell?	55	33.3%	110	2.13	0.920
VB_Do you sing or speak excessively (singing or speaking for too long too often)?	55	33.3%	110	2.44	0.953
VB_Do you speak/sing loudly?	55	33.3%	110	2.82	0.940
How many hours of sleep do you get on average, each night?	55	33.3%	110		
How often do you take physical exercise (Please mention duration in text box) -	55	33.3%	110	2.76	1.091
IPQ_S6_How concerned are you about your voice problem(s)?	54	32.7%	111	4.41	3.186
IPQ_S6_How concerned are you about your voice problem(s)? - Group	54	32.7%	111	1.42	0.720
IPQ_S5_How much do you experience symptoms from your voice problem(s)?	54	32.7%	111	3.28	2.253
IPQ_S5_How much do you experience symptoms from your voice problem(s)? - Group	54	32.7%	111	1.08	0.274
IPQ_S2_How long do you think your voice problem(s)will continue?	54	32.7%	111	3.97	3.279
IPQ_S2_How long do you think your voice problem(s)will continue? - Group	54	32.7%	111	1.37	0.700
VDCQ_S24_I try to convince myself that my voice problem is not really that disabling.	54	32.7%	111	3.16	1.698
VDCQ_S23_I keep my frustrations to myself, so few of my friends know I am frustrated.	54	32.7%	111	2.86	1.439
VDCQ_S22_I cope better with my voice problems by trying to accept it, since nothing can be done.	54	32.7%	111	2.63	1.578
VDCQ_S21_I find it easier to cope with my voice problem by joking about it.	54	32.7%	111	1.95	1.102
How much water do you consume each day?	54	32.7%	111	2.99	0.757
Do you sip water on a regular basis during singing?	54	32.7%	111	2.94	1.012
VDCQ_S20_I find it easy to cope with my voice problem when I compare myself to other people who have worse health problems.	53	32.1%	112	2.39	1.491
VDCQ_S17_I try to become involved in as many physical activities as possible to take my mind off my voice problem.	53	32.1%	112	2.02	1.193
IPQ_S3_How much control do you feel you have over your voice problem(s)?	52	31.5%	113	6.32	2.794

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
IPQ_S3_How much control do you feel you have over your voice problem(s)? - Group	52	31.5%	113	1.79	0.850
IPQ_S1_How much does your voice problem(s)affect your life?	52	31.5%	113	3.45	2.797
IPQ_S1_How much does your voice problem(s)affect your life? - Group	52	31.5%	113	1.20	0.503
VDCQ_S19_I find it easier to cope with my voice problem by finding out as much about it as I can.	52	31.5%	113	3.55	1.798
VDCQ_S18_I try to find as much information as possible about my voice problem.	52	31.5%	113	3.50	1.763
VDCQ_S16_I find it easier to live with my voice problem, if I do not use my voice.	52	31.5%	113	2.12	1.283
Frequency of sensation/symptom - Loss of form	50	30.3%	115	1.57	0.689
Frequency of sensation/symptom - Loss of voice	49	29.7%	116	1.59	0.647
VDCQ_S15_I find myself wishing that I never had a voice problem.	49	29.7%	116	3.55	1.853
VDCQ_S14_I ask people to help me with those things I cannot manage because of my voice problem.	48	29.1%	117	2.21	1.249
Frequency of sensation/symptom - Frequent coughing	47	28.5%	118	1.63	0.726
Frequency of sensation/symptom - Problems with resonance	47	28.5%	118	1.74	0.756
VDCQ_S10_I find it easier to cope with my voice problem by avoiding being with people in general.	47	28.5%	118	2.21	1.358
Frequency of sensation/symptom - Throat itchiness	46	27.9%	119	1.47	0.687
Frequency of sensation/symptom - Huskiness	46	27.9%	119	1.65	0.777
Frequency of sensation/symptom - Harshness	46	27.9%	119	1.52	0.636
VDCQ_S9_I try to avoid situations where my voice problem would become evident.	46	27.9%	119	2.82	1.400
Frequency of sensation/symptom - Difficulty with vocal ornaments	45	27.3%	120	1.67	0.653
VDCQ_S13_I find it easier to cope with my voice problem wishing that it would go away or somehow be over with.	45	27.3%	120	2.53	1.720
VDCQ_S12_I take the view that there is little I can do about my voice problem.	45	27.3%	120	2.18	1.364
VDCQ_S11_I find it easier to cope with my voice problem by telling myself not to think about it.	45	27.3%	120	2.68	1.496
VDCQ_S8_I find religion and praying to God help me to cope with my voice problem.	45	27.3%	120	2.39	1.672
VDCQ_S7_When my voice gets bad, I find myself taking it out on others around me.	45	27.3%	120	2.14	1.232
VDCQ_S6_I find it easier to cope with my voice problem if I ask the doctor questions about.	45	27.3%	120	2.72	1.529
Frequency of sensation/symptom - Singing loudly	42	25.5%	123	1.82	0.869
VDCQ_S4_I keep any worries I may have about my voice problem to myself.	42	25.5%	123	3.07	1.559

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
Frequency of sensation/symptom - Lack of flexibility	41	24.8%	124	1.95	0.731
VDCQ_S5_Having a voice problem has helped me to find some important truth about my life.	41	24.8%	124	2.88	1.760
Frequency of sensation/symptom - Problems with transition between registers/passaggio (moving from lower pitch to higher pitch or vice versa)	40	24.2%	125	1.94	0.836
VDCQ_S3_I find talking with friends and family about my voice problem helpful.	40	24.2%	125	2.78	1.502
VDCQ_S2_I find it easier to cope with my voice problem by expressing my feelings outwardly.	40	24.2%	125	2.82	1.454
VDCQ_S1_It helps me to cope with my voice problem if other people are sympathetic.	40	24.2%	125	2.78	1.558
Frequency of sensation/symptom - Throat dryness	39	23.6%	126	1.94	0.678
SVHI_S36_I have to cancel performances, singing engagements, rehearsals, or practices because of my singing.	39	23.6%	126	0.79	1.014
Frequency of sensation/symptom - Voice breaks	38	23.0%	127	1.88	0.612
Frequency of sensation/symptom - Hoarseness	38	23.0%	127	1.78	0.677
SVHI_S35_I feel left out of the music scene because of my voice.	38	23.0%	127	0.82	1.151
SVHI_S33_I feel something is missing in my life because of my inability to sing.	38	23.0%	127	0.81	1.193
Frequency of sensation/symptom - Frequent throat clearing	37	22.4%	128	1.95	0.841
Frequency of sensation/symptom - Lack of control over voice/unsteady voice/wobble	37	22.4%	128	1.85	0.824
Frequency of sensation/symptom - Throat tightness	37	22.4%	128	1.93	0.723
Frequency of sensation/symptom - Singing softly	37	22.4%	128	1.81	0.858
Frequency of sensation/symptom - Reaching lower notes	37	22.4%	128	1.95	0.946
Frequency of sensation/symptom - Problems sustaining notes	36	21.8%	129	1.95	0.887
SVHI_S34_I am worried my singing problems will cause me to lose money.	36	21.8%	129	0.62	1.002
SVHI_S32_I am unsure of what will come out when I sing.	36	21.8%	129	1.01	1.004
SVHI_S31_I feel pain, tickling, or choking when I sing.	36	21.8%	129	0.84	0.925
SVHI_S20_I have trouble controlling the raspiness in my voice.	36	21.8%	129	0.78	0.884
SVHI_S30_My singing voice tires easily.	35	21.2%	130	1.51	1.115
SVHI_S25_My singing sounds forced.	35	21.2%	130	1.07	0.950
Frequency of sensation/symptom - Breathiness	34	20.6%	131	1.87	0.798
SVHI_S29_My singing makes me feel handicapped.	34	20.6%	131	0.53	0.963

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
SVHI_S28_My singing voice makes it difficult for the audience to hear me.	34	20.6%	131	0.56	0.796
SVHI_S24_My singing makes me feel incompetent.	34	20.6%	131	0.91	1.077
Frequency of sensation/symptom - Lack of breath support/breath control	33	20.0%	132	2.02	0.838
Frequency of sensation/symptom - Vocal strain/effortful singing	33	20.0%	132	2.25	0.841
Frequency of sensation/symptom - Throat pain	33	20.0%	132	1.82	0.729
Frequency of sensation/symptom - Overall reduced pitch range	33	20.0%	132	2.06	0.872
SVHI_S27_My voice quality is inconsistent.	33	20.0%	132	1.24	1.160
SVHI_S26_My speaking voice is hoarse after I sing.	33	20.0%	132	1.18	1.018
SVHI_S22_I have difficulty staying on pitch when I sing.	33	20.0%	132	0.93	0.934
SVHI_S21_I have trouble singing loudly.	33	20.0%	132	0.98	1.015
Frequency of sensation/symptom - Vocal fatigue	32	19.4%	133	2.27	0.872
Frequency of sensation/symptom - Lack of vocal power	32	19.4%	133	1.92	0.813
SVHI_S23_I feel anxious about my singing.	32	19.4%	133	1.35	1.232
SVHI_S19_I have trouble controlling the breathiness in my voice.	32	19.4%	133	1.25	1.111
SVHI_S17_I have trouble making my voice do what I want it to.	31	18.8%	134	1.37	1.038
SVHI_S12_My speaking voice is not normal.	31	18.8%	134	0.66	0.951
SVHI_S18_I have to “push it” to produce my voice when singing.	30	18.2%	135	1.20	1.078
SVHI_S16_My singing voice is never normal.	30	18.2%	135	0.82	1.085
SVHI_S9_I am embarrassed by my singing	30	18.2%	135	0.87	1.018
SVHI_S15_I have no confidence in my singing voice.	29	17.6%	136	0.99	1.102
SVHI_S13_My throat is dry when I sing.	29	17.6%	136	1.43	0.908
SVHI_S3_I am frustrated by my singing	29	17.6%	136	1.32	1.074
SVHI_S2_My voice cracks and breaks.	29	17.6%	136	1.18	0.888
SVHI_S14_I’ve had to eliminate certain songs from my singing/performances.	28	17.0%	137	1.36	1.103
SVHI_S11_I get nervous before I sing because of my singing problems.	28	17.0%	137	1.19	1.216
SVHI_S10_I am unable to use my “high voice.”	28	17.0%	137	1.25	1.155
SVHI_S8_My singing problems make me not want to sing/perform.	28	17.0%	137	1.13	1.143
SVHI_S7_My singing voice upsets me	28	17.0%	137	1.18	1.070

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
SVHI_S4_People ask “What is wrong with your voice?” when I sing.	28	17.0%	137	0.62	0.892
SVHI_S6_My voice “gives out” on me while I am singing. (give out refers to your voice stopping to function satisfactorily)	27	16.4%	138	1.11	0.941
SVHI_S5_My ability to sing varies day to day.	27	16.4%	138	1.67	1.083
SVHI_S1_It takes a lot of effort to sing.	27	16.4%	138	1.51	0.998
Frequency of sensation/symptom - Reaching higher notes	25	15.2%	140	2.26	0.870
Performance-Hours per month	17	10.3%	148	11.0895	18.08970

MISSING VALUES AT SCALE LEVEL

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
Has COVID-19 had an impact on your voice? - Selected Choice	59	35.8%	106	1.36	0.665
Are you currently taking any medications which impact your voice? - Selected Choice	58	35.2%	107	1.07	0.264
a) Have you had/are you currently suffering from any medical condition which could impact your voice? - Selected Choice	57	34.5%	108	1.19	0.398
b) Have you had any surgery which could have an impact on your voice? - Selected Choice	57	34.5%	108	1.09	0.291
Do you travel to give performances? (Please answer this question reflecting from your travel history prior to COVID-19)	57	34.5%	108	1.55	0.500
Are you	57	34.5%	108	1.81	1.363
VDCQ_Tension_red_ADJ	57	34.5%	108		
VB_Do you use amplification while singing?	56	33.9%	109	1.98	0.991
VB_Do you clench your jaw/teeth while singing?	56	33.9%	109	1.44	0.713
VB_Do you clear your throat?	56	33.9%	109	2.50	0.909
Do you experience work related stress in your singing job(s)?	56	33.9%	109	2.14	0.967
How frequently do you suffer from colds/allergies?	56	33.9%	109	2.22	1.003
Do you have performance anxiety?	56	33.9%	109	2.19	0.876
Do you think you have a positive attitude towards your voice and singing?	56	33.9%	109	4.10	1.027
Please indicate your highest level of education	56	33.9%	109	3.57	0.644

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
IPQ_S8_How much does your problem(s) affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)	55	33.3%	110	4.86	3.210
IPQ_S8_How much does your problem(s) affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?) - Group	55	33.3%	110	1.48	0.726
IPQ_S7_How well do you feel you understand your problem(s)?	55	33.3%	110	6.97	2.960
IPQ_S7_How well do you feel you understand your problem(s)? - Group	55	33.3%	110	2.06	0.870
IPQ_S4_How much do you think your treatment can help your voice problem(s)?	55	33.3%	110	6.45	2.879
IPQ_S4_How much do you think your treatment can help your voice problem(s)? - Group	55	33.3%	110	1.84	0.862
Do you regularly warm up and cool down your voice before and after singing?	55	33.3%	110	2.92	1.042
VB_Do you sing when you are unwell?	55	33.3%	110	2.13	0.920
VB_Do you sing or speak excessively (singing or speaking for too long too often)?	55	33.3%	110	2.44	0.953
VB_Do you speak/sing loudly?	55	33.3%	110	2.82	0.940
How many hours of sleep do you get on average, each night?	55	33.3%	110		
How often do you take physical exercise (Please mention duration in text box) - Selected Choice	55	33.3%	110	2.76	1.091
VDCQ_Pos_reapp_ADJ	55	33.3%	110	11.5242	4.90511
IPQ_S6_How concerned are you about your voice problem(s)?	54	32.7%	111	4.41	3.186
IPQ_S6_How concerned are you about your voice problem(s)? - Group	54	32.7%	111	1.42	0.720
IPQ_S5_How much do you experience symptoms from your voice problem(s)?	54	32.7%	111	3.28	2.253
IPQ_S5_How much do you experience symptoms from your voice problem(s)? - Group	54	32.7%	111	1.08	0.274
IPQ_S2_How long do you think your voice problem(s)will continue?	54	32.7%	111	3.97	3.279
IPQ_S2_How long do you think your voice problem(s)will continue? - Group	54	32.7%	111	1.37	0.700
How much water do you consume each day?	54	32.7%	111	2.99	0.757
Do you sip water on a regular basis during singing?	54	32.7%	111	2.94	1.012
IPQ_S3_How much control do you feel you have over your voice problem(s)?	52	31.5%	113	6.32	2.794
IPQ_S3_How much control do you feel you have over your voice problem(s)? - Group	52	31.5%	113	1.79	0.850

ITEM	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
IPQ_S1_How much does your voice problem(s)affect your life?	52	31.5%	113	3.45	2.797
IPQ_S1_How much does your voice problem(s)affect your life? - Group	52	31.5%	113	1.20	0.503
VDCQ_Info_seek_ADJ	51	30.9%	114		
VDCQ_Distancing_ADJ	51	30.9%	114	14.4754	5.82521
VDCQ_Escape_Av_ADJ	46	27.9%	119	15.3966	6.20694
Voc_Perf_no_reson_Adj	41	24.8%	124	12.8993	3.92140
VDCQ_Self_control_ADJ	41	24.8%	124		
VDCQ_Social_ADJ	40	24.2%	125	13.2227	5.25248
Acoustic_Inadeq_Resonance_adj	36	21.8%	129	13.5562	3.88315
SVHI_Vocational_ADJ	36	21.8%	129	4.3488	4.32385
Throat_Symp_Mean_Adj	34	20.6%	131	15.2970	4.18820
Voc_Clo_Mean_Adj	32	19.4%	133	10.4098	2.81570
SVHI_Aud_Per_ADJ	32	19.4%	133	9.8362	6.30849
SVHI_MEAN_ADJ	31	18.8%	134	38.1379	25.86607
SVHI_Consistency_ADJ	31	18.8%	134	9.2749	5.74043
SVHI_Emotional_ADJ	30	18.2%	135	9.4104	8.03044
SVHI_Functional_ADJ	28	17.0%	137	5.1759	4.41396
Performance-Hours per month	17	10.3%	148	11.0895	18.08970

Appendix 6.2: Mean frequency scores of vocal symptoms reported by Carnatic and Western classical singers

Symptoms	Western Classical (n=63)		Carnatic (n=102)		Total (n=165)	
	Mean	SD	Mean	SD	Mean	SD
Reaching higher notes	2.14	0.860	2.36	0.870	2.26	0.870
Vocal strain/effortful singing	2.13	0.708	2.33	0.916	2.25	0.841
Vocal fatigue	2.21	0.818	2.32	0.912	2.27	0.872
Reaching lower notes	1.59	0.740	2.22	0.997	1.95	0.946
Lack of breath support	1.75	0.617	2.19	0.921	2.02	0.838
Frequent throat clearing	1.72	0.717	2.12	0.885	1.95	0.841
Overall reduced pitch range	2.00	0.831	2.11	0.903	2.06	0.872
Breathiness	1.53	0.668	2.10	0.799	1.87	0.798
Problems sustaining notes	1.73	0.744	2.09	0.948	1.95	0.887
Throat dryness	1.75	0.622	2.07	0.689	1.94	0.678
Lack of vocal power	1.73	0.732	2.06	0.843	1.92	0.813
Singing loudly	1.56	0.744	2.03	0.907	1.82	0.869
Singing softly	1.57	0.767	1.99	0.884	1.81	0.858
Lack of flexibility	1.96	0.727	1.95	0.738	1.95	0.731
Lack of control over voice	1.74	0.782	1.93	0.849	1.85	0.824
Problems with passaggio	2.02	0.765	1.89	0.887	1.94	0.836
Throat pain	1.72	0.712	1.88	0.738	1.82	0.729
Voice breaks	1.88	0.676	1.88	0.569	1.88	0.612
Throat tightness	2.00	0.673	1.88	0.758	1.93	0.723
Hoarseness	1.70	0.575	1.84	0.741	1.78	0.677
Difficulty with vocal ornaments	1.55	0.503	1.75	0.736	1.67	0.653
Problems with resonance	1.76	0.723	1.72	0.784	1.74	0.756
Huskiness	1.57	0.662	1.71	0.861	1.65	0.777
Loss of form	1.41	0.537	1.70	0.764	1.57	0.689
Frequent coughing	1.64	0.749	1.62	0.713	1.63	0.726
Harshness	1.41	0.599	1.62	0.654	1.52	0.636
Loss of voice	1.70	0.678	1.50	0.614	1.59	0.647
Throat itchiness	1.44	0.669	1.49	0.704	1.47	0.687

Appendix 6.3: Principal Component Analysis (PCA) results and mapping process of Frequency of Symptoms scale

Table 1: EIGEN VALUES

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.869	31.675	31.675	8.869	31.675	31.675
2	1.964	7.013	38.688	1.964	7.013	38.688
3	1.696	6.057	44.745	1.696	6.057	44.745
4	1.596	5.700	50.445	1.596	5.700	50.445
5	1.306	4.665	55.110	1.306	4.665	55.110
6	1.254	4.480	59.590	1.254	4.480	59.590
7	1.096	3.913	63.503	1.096	3.913	63.503
8	.971	3.467	66.969			
9	.864	3.085	70.054			
10	.771	2.753	72.807			

Fig 2: SCREE PLOT

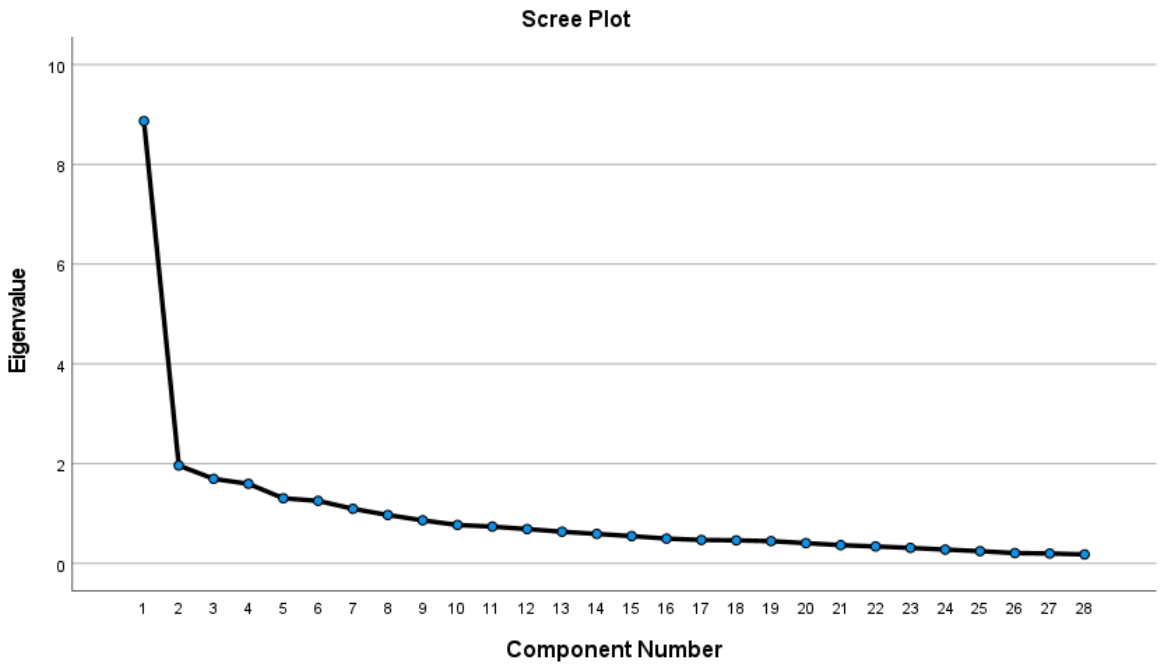


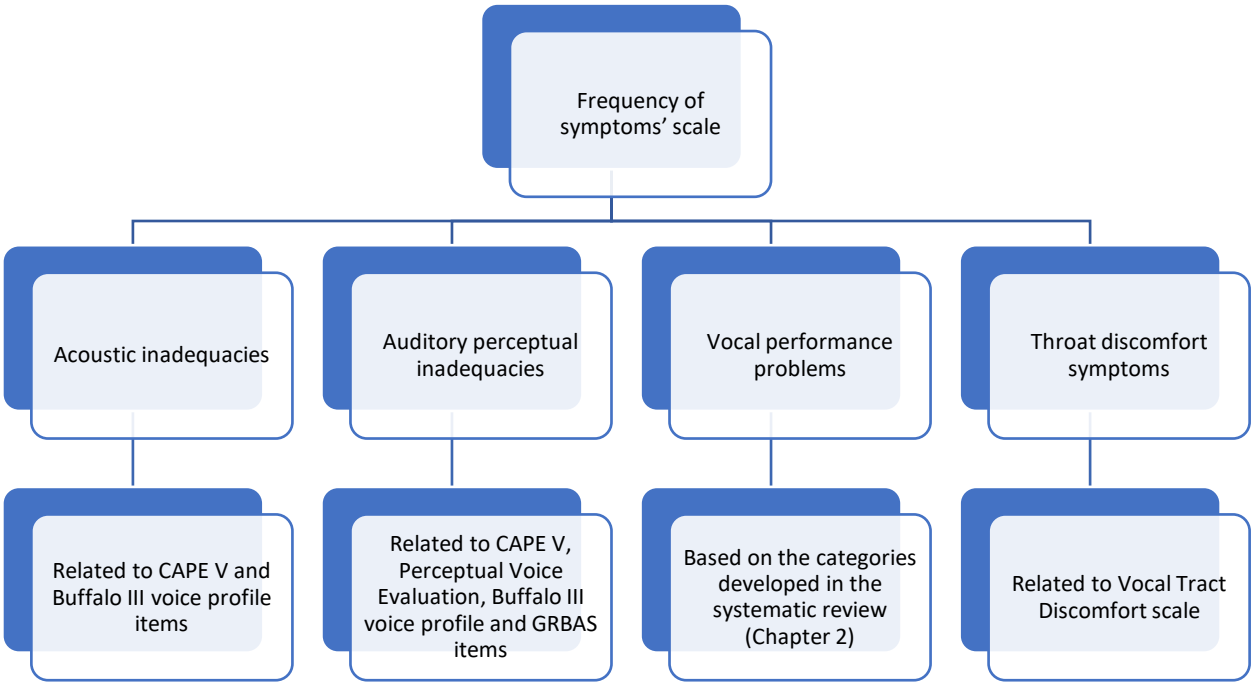
Table 2: FAILED PCA LOADINGS

	Component			
	1	2	3	4
Problems with transition between registers/passaggio (moving from lower pitch to higher pitch or vice versa)	**.821**	-.088	.013	-.106
Problems with resonance	**.716**	.173	-.064	.036
Lack of flexibility	**.691**	-.002	.132	-.066
Voice breaks	**.673**	.196	-.137	.026
Overall reduced pitch range	**.671**	.004	-.307	.372
Throat tightness	**.620**	.173	-.002	.088
Lack of control over voice/unsteady voice/wobble	**.611**	.083	.196	-.072
Problems sustaining notes	**.576**	-.114	.410	-.069
Vocal strain/effortful singing	**.494**	.233	.152	.159
Reaching higher notes	**.487**	-.132	.035	.467
Vocal fatigue	**.445**	.144	.244	.204
Difficulty with vocal ornaments	.360	.247	.162	-.090
Frequent coughing	.158	**.673**	.039	-.215
Frequent throat clearing	.040	**.668**	-.006	.123
Hoarseness	-.053	**.658**	-.011	.287
Loss of voice	.203	**.651**	-.149	-.124
Throat pain	.106	**.472**	.111	.251
Throat itchiness	.010	**.465**	.147	-.120
Loss of form	.202	**.437**	.230	.067
Lack of breath support/breath control	.193	-.113	**.823**	-.136
Breathiness	-.134	.256	**.708**	.137
Reaching lower notes	.024	.009	**.571**	.164
Throat dryness	-.064	.331	.392	.256
Lack of vocal power	.307	.070	.353	.164
Huskiness	.114	.243	.297	-.058
Singing softly	.076	-.009	.022	**.703**
Harshness	-.101	.402	-.020	**.647**
Singing loudly	.058	-.176	.268	**.542**
Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.[a]				
The numbers in bold indicate items which fit within the factor				

MAPPING APPROACH UNDERTAKEN TO DETERMINE SUBSCALES OF FREQUENCY OF SYMPTOMS ITEMS

The mapping of the items within the frequency of symptoms was not as straightforward as mapping of VDCQ and SVHI since multi-item multidimensional tools to subjectively assess vocal symptoms are limited. A few established perceptual assessment (clinician centred) tools such as CAPE V (CAPE-V, ASLHA, 2002), GRBAS (Hirano, 1981) and Perceptual voice profile was used (Oates and Russell, 1998). The client centred subjective measure relevant for the items was the vocal tract discomfort scale (Matheison, 1993) and Buffalo III voice profile (Wilson, 1989), which were employed along with the perceptual measures.

Fig 2: Diagrammatic representation of the mapping process highlighting the assessment tools undertaken during the process



Since none of these tools also provide multidimensional assessments, scales were logically and theoretically created after which internal reliability was assessed and verified to be adequate. Acoustic inadequacies primarily included items related to pitch and loudness (and resonance) which have been represented in CAPE V, Buffalo III voice profile and Perceptual voice evaluation. Auditory perceptual inadequacies subscale included mostly items related to voice quality which is the construct measured by GRBAS and Perceptual voice evaluation and one of the aspects measured by Buffalo III voice profile and CAPE V. The throat discomfort scale which includes physical symptoms experienced by individuals was

made into a construct called Throat Discomfort symptoms with similar items. None of the currently available tools include items within the vocal performance subscale-these included items related to voice problems which impact professional vocal performance.

Table 3: Mapping of symptoms in relation to the items within the established tools

FREQUENCY OF SYMPTOMS ITEMS	VOCAL TRACT DISCOMFORT SCALE	GRBAS	CAPE V	Buffalo III voice profile	Perceptual voice evaluation
Vocal fatigue					
Throat pain	Aching				
Throat tightness	Tightness				
Throat dryness	Dryness				
Throat itchiness	Itching				
Vocal strain/effortful singing		Strain	Strain		Strained
Frequent coughing	Irritated throat				
Frequent throat clearing	Lump in throat				
Harshness		Roughness	Roughness	Harsh	Rough
Hoarseness				Hoarse	
Breathiness		Breathiness	Breathiness	Breathy	Breathy
Huskiness		Asthenia			
Voice breaks					Phonation breaks
Loss of voice					
Problems reaching higher notes			Pitch		Pitch
Difficulty reaching lower notes				High pitch	
Overall reduced pitch range				Low pitch	
Difficulty singing softly			Loudness	Increase loudness	Loudness
Difficulty singing loudly				Decrease loudness	
Lack of vocal power					
Resonance problems					Resonance

FREQUENCY OF SYMPTOMS ITEMS	VOCAL TRACT DISCOMFORT SCALE	GRBAS	CAPE V	Buffalo III voice profile	Perceptual voice evaluation
Lack of control over voice					
Lack of flexibility					
Loss of form					
Difficulty with vocal ornaments					
Problems sustaining notes					
Lack of breath support					
Difficulties with Passaggio					

Appendix 6.4: Principal Component Analysis (PCA) results and mapping process of Singing Voice Handicap Index

Table 1: EIGEN VALUES OF SVHI INDICATING A 6-FACTOR SOLUTION

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	17.132	47.589	47.589	17.132	47.589	47.589
2	2.449	6.804	54.393	2.449	6.804	54.393
3	1.525	4.236	58.629	1.525	4.236	58.629
4	1.146	3.183	61.812	1.146	3.183	61.812
5	1.070	2.973	64.784	1.070	2.973	64.784
6	1.040	2.888	67.672	1.040	2.888	67.672
7	.964	2.677	70.349			
8	.915	2.542	72.891			
9	.814	2.262	75.154			
10	.705	1.957	77.111			

Fig 1: SCREE PLOT

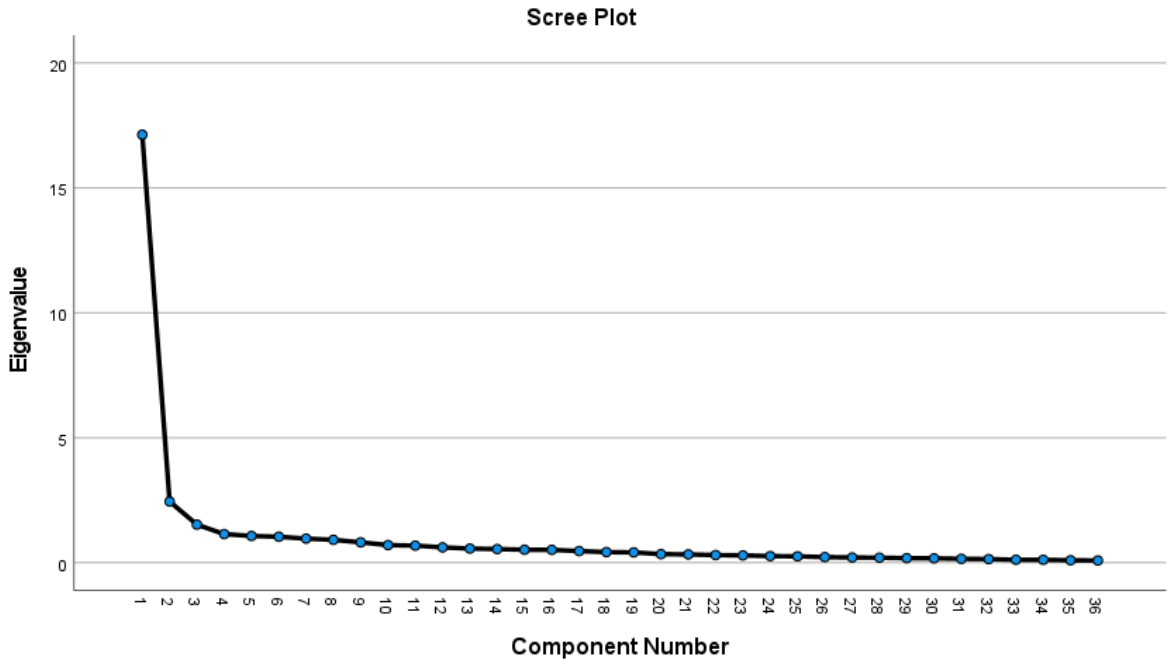


Table 2: FAILED PCA LOADINGS

	Component					
	1	**2**	**3**	**4**	**5**	**6**
SVHI_S9_I am embarrassed by my singing	**.874**	.141	-.027	.087	.038	-.098
SVHI_S7_My singing voice upsets me	**.865**	-.025	.065	.075	.027	.044
SVHI_S8_My singing problems make me not want to sing/perform.	**.832**	.040	.021	.009	.088	-.008
SVHI_S15_I have no confidence in my singing voice.	**.757**	.100	.094	.183	.047	.188
SVHI_S5_My ability to sing varies day to day.	**.723**	-.021	-.144	-.211	-.088	.046
SVHI_S3_I am frustrated by my singing	**.716**	-.162	.183	-.224	-.007	-.187
SVHI_S16_My singing voice is never normal.	**.684**	.111	-.042	.118	.387	.091
SVHI_S11_I get nervous before I sing because of my singing problems.	**.641**	-.002	.134	-.030	.139	.191
SVHI_S24_My singing makes me feel incompetent.	**.622**	.260	.184	.106	-.229	-.069
SVHI_S17_I have trouble making my voice do what I want it to.	**.574**	.217	.083	-.124	-.176	.122
SVHI_S29_My singing makes me feel handicapped.	**.532**	.135	.193	.285	-.034	.252
SVHI_S27_My voice quality is inconsistent.	**.524**	.150	.032	-.353	-.224	.017
SVHI_S14_I've had to eliminate certain songs from my singing/performances.	**.504**	-.003	.154	-.088	.015	.241
SVHI_S6_My voice "gives out" on me while I am singing. (give out refers to your voice stopping to function satisfactorily)	.487	.031	.112	-.173	-.176	.263
SVHI_S23_I feel anxious about my singing.	.483	.052	.288	-.360	-.015	.015
SVHI_S10_I am unable to use my "high voice."	.453	.156	.086	-.202	-.019	.095
SVHI_S18_I have to "push it" to produce my voice when singing.	.448	.184	.158	-.287	.030	.037
SVHI_S32_I am unsure of what will come out when I sing.	.428	.148	.255	-.056	-.420	.181
SVHI_S25_My singing sounds forced.	.366	.287	.267	-.163	-.232	-.031
SVHI_S28_My singing voice makes it difficult for the audience to hear me.	.047	**.853**	.067	.238	-.034	.007
SVHI_S21_I have trouble singing loudly.	-.034	**.838**	-.016	-.064	.100	-.111
SVHI_S20_I have trouble controlling the raspiness in my voice.	-.026	**.736**	.061	-.118	-.038	.173
SVHI_S19_I have trouble controlling the breathiness in my voice.	-.076	**.505**	.018	-.291	.076	.232

SVHI_S4_People ask “What is wrong with your voice?” when I sing.	.097	.408	-.026	-.207	.262	.243
SVHI_S34_I am worried my singing problems will cause me to lose money.	-.028	.034	**.913**	-.137	-.030	-.214
SVHI_S36_I have to cancel performances, singing engagements, rehearsals, or practices because of my singing.	.009	-.022	**.724**	.067	.224	.319
SVHI_S35_I feel left out of the music scene because of my voice.	.175	.079	**.623**	.142	-.036	.271
SVHI_S13_My throat is dry when I sing.	-.124	.149	.147	**-.580**	.105	.232
SVHI_S26_My speaking voice is hoarse after I sing.	.215	.416	-.171	-.431	-.014	.006
SVHI_S22_I have difficulty staying on pitch when I sing.	.196	.166	.224	-.390	.073	.066
SVHI_S30_My singing voice tires easily.	.292	.010	.129	-.343	.020	.303
SVHI_S12_My speaking voice is not normal.	.195	.200	.220	-.126	**.578**	-.096
SVHI_S31_I feel pain, tickling, or choking when I sing.	-.121	.127	.089	-.029	-.072	**.783**
SVHI_S1_It takes a lot of effort to sing.	.327	-.089	-.006	-.249	.096	**.523**
SVHI_S2_My voice cracks and breaks.	.239	.240	-.260	-.249	.077	.461
SVHI_S33_I feel something is missing in my life because of my inability to sing.	.364	.119	.328	.174	-.229	.372
Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. **The numbers in bold indicate items which fit within the factor**						

Table 3: MAPPING OF SVHI ITEMS BASED ON VHI SUBSCALES-PHYSICAL SUBSCALE

VHI ITEMS	CORRELATING SVHI ITEMS	ITEMS UNIQUE TO SVHI WHICH FITS PHYSICAL SUBSCALE THEORETICALLY
I run out of air when I talk.		S2. My voice cracks and breaks.
The sound of my voice varies throughout the day	S5. My ability to sing varies day to day.	S25. My singing sounds forced.
People ask, "What's wrong with your voice?"	S4. People ask "What is wrong with your voice?" when I sing.	S26. My speaking voice is hoarse after I sing.
My voice sounds creaky and dry.	S13. My throat is dry when I sing.	S30. My singing voice tires easily.
I feel as though I have to strain to produce voice.	S18. I have to "push it" to produce my voice when singing.	S31. I feel pain, tickling, or choking when I sing.
The clarity of my voice is unpredictable.	S27. My voice quality is inconsistent.	S19. I have trouble controlling the breathiness in my voice.
I try to change my voice to sound different.		S20. I have trouble controlling the raspiness in my voice.
I use a great deal of effort to speak.	S1. It takes a lot of effort to sing.	S21. I have trouble singing loudly.
My voice is worse in the evening.		S10. I am unable to use my "high voice."
My voice "gives out" on me in the middle of speaking.	S6. My voice "gives out" on me while I am singing.	S22. I have difficulty staying on pitch when I sing.

Table 4: MAPPING OF SVHI ITEMS BASED ON VHI SUBSCALES-FUNCTIONAL SUBSCALE

VHI ITEMS	CORRELATING SVHI ITEMS	ITEMS UNIQUE TO SVHI WHICH FITS FUNCTIONAL SUBSCALE THEORETICALLY
My voice makes it difficult for people to hear me.	S28. My singing voice makes it difficult for the audience to hear me.	S17. I have trouble making my voice do what I want it to.
People have difficulty understanding me in a noisy room		S14. I've had to eliminate certain songs from my singing/performances.

My family has difficulty hearing me when I call them throughout the house.		S33. I feel something is missing in my life because of my inability to sing.
I use the phone less often than I would like		S36. I have to cancel performances, singing engagements, rehearsals, or practices because of my singing.
I tend to avoid groups of people because of my voice.	S8. My singing problems make me not want to sing/perform.	S12. My speaking voice is not normal.
I speak with friends, neighbors, or relatives less often because of my voice.		S16. My singing voice is never normal.
People ask me to repeat myself when speaking face-to-face.		
My voice difficulties restrict my personal and social life.		
I feel left out in conversations because of my voice.	S35. I feel left out of the music scene because of my voice.	
My voice problem causes me to lose income.	S34. I am worried my singing problems will cause me to lose money.	

Table 5: MAPPING OF SVHI ITEMS BASED ON VHI SUBSCALES-EMOTIONAL SUBSCALE

VHI ITEMS	CORRELATING SVHI ITEMS	ITEMS UNIQUE TO SVHI WHICH FITS FUNCTIONAL SUBSCALE THEORETICALLY
I'm tense when talking with others because of my voice	S11. I get nervous before I sing because of my singing problems.	S15. I have no confidence in my singing voice.
People seem irritated with my voice.		S23. I feel anxious about my singing.
I find other people don't understand my voice problem		S32. I am unsure of what will come out when I sing.
My voice problem upsets me	S7. My singing voice upsets me.	S3. I am frustrated by my singing
I am less outgoing because of my voice problem.		

My voice makes me feel handicapped.	S29. My singing makes me feel handicapped.	
I feel annoyed when people ask me to repeat.		
I feel embarrassed when people ask me to repeat.	S9. I am embarrassed by my singing	
My voice makes me feel incompetent.	S24. My singing makes me feel incompetent	
I'm ashamed of my voice.		

Appendix 6.5: IPQ-9 factors which are believed to cause voice problems (open text item)

Factor	WC - N (%)	Carnatic - N (%)
Overworking/high vocal load/overuse	10 (22.2%)	8 (12.9%)
Stress	9 (20.0%)	3 (4.8%)
Incorrect singing technique	9 (20.0%)	1 (1.6%)
Voice misuse	7 (15.6%)	6 (9.7%)
Diet	5 (11.1%)	2 (3.2%)
Anxiety	4 (8.9%)	2 (3.2%)
Lack of rest/tiredness	3 (6.7%)	8 (12.9%)
Reflux	3 (6.7%)	2 (3.2%)
Chronic cough	2 (4.4%)	0
Post pregnancy changes	2 (4.4%)	0
Bottling things up	2 (4.4%)	0
Lack of physical activity	2 (4.4%)	0
Menopause	2 (4.4%)	0
genetics	2 (4.4%)	6 (9.7%)
Incomplete/poor training	2 (4.4%)	3 (4.8%)
Infections/colds/sinus issues	2 (4.4%)	2 (3.2%)
Ageing	2 (4.4%)	1 (1.6%)
Allergies	2 (4.4%)	1 (1.6%)
fibrotic scar tissue in the airways	1 (2.2%)	0
Working while sick	1 (2.2%)	0
Lack of access to singing voice specialists	1 (2.2%)	0
Singing outdoors (during Covid)	1 (2.2%)	0
Learning singing too quickly	1 (2.2%)	0
Ehler's-Danlos Syndrome	1 (2.2%)	0
Dysautonomia	1 (2.2%)	0
Fibromyalgia	1 (2.2%)	0
Grief	1 (2.2%)	0
Depression	1 (2.2%)	0
Hiatal hernia	1 (2.2%)	0
Pre Menstrual Vocal Syndrome	1 (2.2%)	0
Musculo-skeletal injury	1 (2.2%)	0
Smoking	1 (2.2%)	0
Steroid inhalers	1 (2.2%)	0
Lack of warm up	1 (2.2%)	3 (4.8%)
Lack of understanding of vocal physiology	1 (2.2%)	2 (3.2%)
Not working to solve the voice problem	1 (2.2%)	2 (3.2%)
Lifestyle	1 (2.2%)	1 (1.6%)
Lack of sleep	1 (2.2%)	1 (1.6%)
Surgery	1 (2.2%)	1 (1.6%)

Factor	WC - N (%)	Carnatic - N (%)
Lack of practice	0	9 (14.5%)
Talking	0	6 (9.7%)
Carelessness	0	2 (3.2%)
Refrigerated items	0	2 (3.2%)
Thyroid issues	0	1 (1.6%)
Dehydration	0	1 (1.6%)
Asthma	0	1 (1.6%)
Oily food	0	1 (1.6%)
Laziness	0	1 (1.6%)
Performing in other genre	0	1 (1.6%)
Part time singing	0	1 (1.6%)
Cold weather	0	1 (1.6%)
Poor acoustics	0	1 (1.6%)

Appendix 6.6 Mean frequency scores of VDCQ items of Western classical and Carnatic singers

VDCQ items	Western Classical		Carnatic	
	Mean	SD	Mean	SD
S1- It helps me to cope with my voice problem if other people are sympathetic.	3.42	1.73	2.32	1.24
S2- I find it easier to cope with my voice problem by expressing my feelings outwardly.	3.08	1.57	2.64	1.35
S3- I find talking with friends and family about my voice problem helpful.	2.75	1.60	2.79	1.44
S4- I keep any worries I may have about my voice problem to myself.	3.13	1.50	3.03	1.61
S5- Having a voice problem has helped me to find some important truth about my life.	3.06	1.86	2.75	1.68
S6- I find it easier to cope with my voice problem if I ask the doctor questions about.	2.88	1.72	2.59	1.36
S7- When my voice gets bad, I find myself taking it out on others around me.	2.31	1.37	2.01	1.11
S8- I find religion and praying to God help me to cope with my voice problem.	1.73	1.25	2.90	1.78
S9- I try to avoid situations where my voice problem would become evident.	2.61	1.30	2.99	1.46
S10- I find it easier to cope with my voice problem by avoiding being with people in general.	2.10	1.40	2.30	1.33
S11- I find it easier to cope with my voice problem by telling myself not to think about it.	2.20	1.27	3.03	1.56
S12- I take the view that there is little I can do about my voice problem.	1.63	1.00	2.58	1.46
S13- I find it easier to cope with my voice problem wishing that it would go away or somehow be over with.	1.81	1.25	3.09	1.83
S14- I ask people to help me with those things I cannot manage because of my voice problem.	2.08	1.19	2.29	1.29
S15- I find myself wishing that I never had a voice problem.	3.18	1.80	3.82	1.86
S16- I find it easier to live with my voice problem, if I do not use my voice.	2.40	1.54	1.92	1.03
S17- I try to become involved in as many physical activities as possible to take my mind off my voice problem.	1.80	0.98	2.19	1.32
S18- I try to find as much information as possible about my voice problem.	4.10	1.86	3.03	1.54
S19- I find it easier to cope with my voice problem by finding out as much about it as I can.	4.25	1.83	3.03	1.60
S20- I find it easy to cope with my voice problem when I compare myself to other people who have worse health problems.	2.04	1.34	2.66	1.56
S21- I find it easier to cope with my voice problem by joking about it.	2.13	1.30	1.81	0.91
S22- I cope better with my voice problems by trying to accept it, since nothing can be done.	2.40	1.50	2.81	1.62
S23- I keep my frustrations to myself, so few of my friends know I am frustrated.	3.06	1.37	2.70	1.48
S24- I try to convince myself that my voice problem is not really that disabling.	2.77	1.51	3.46	1.79
S25- Having a voice problem has helped me develop into a better person.	2.98	1.73	2.80	1.72
S26- I ignore my voice problem by looking at only the good things in life	2.02	1.13	2.98	1.67
S27- Resting my voice at times, helps me cope with my voice problem.	4.02	1.38	4.15	1.49
A1- I find it easier to cope with my voice problems by involving myself in activities unrelated to singing	3.13	1.63	3.15	1.72
A2- I tend to resort to home remedies when I have a voice problem	3.60	1.64	3.95	1.58
A3- I find it easier to cope with my voice problem if I make myself think that I do not have a problem	2.13	1.36	3.05	1.71

Appendix 6.7: Principal Component Analysis (PCA) results and mapping process of VDCQ

Table 1: EIGEN VALUES OF VDCQ SUBSCALES

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.729	29.096	29.096	8.729	29.096	29.096
2	3.160	10.533	39.629	3.160	10.533	39.629
3	2.318	7.727	47.356	2.318	7.727	47.356
4	1.863	6.210	53.566	1.863	6.210	53.566
5	1.469	4.898	58.463	1.469	4.898	58.463
6	1.327	4.424	62.887	1.327	4.424	62.887
7	1.148	3.828	66.716	1.148	3.828	66.716
8	1.064	3.548	70.264	1.064	3.548	70.264
9	.925	3.082	73.346			
10	.802	2.674	76.020			

Fig 1: SCREE PLOT

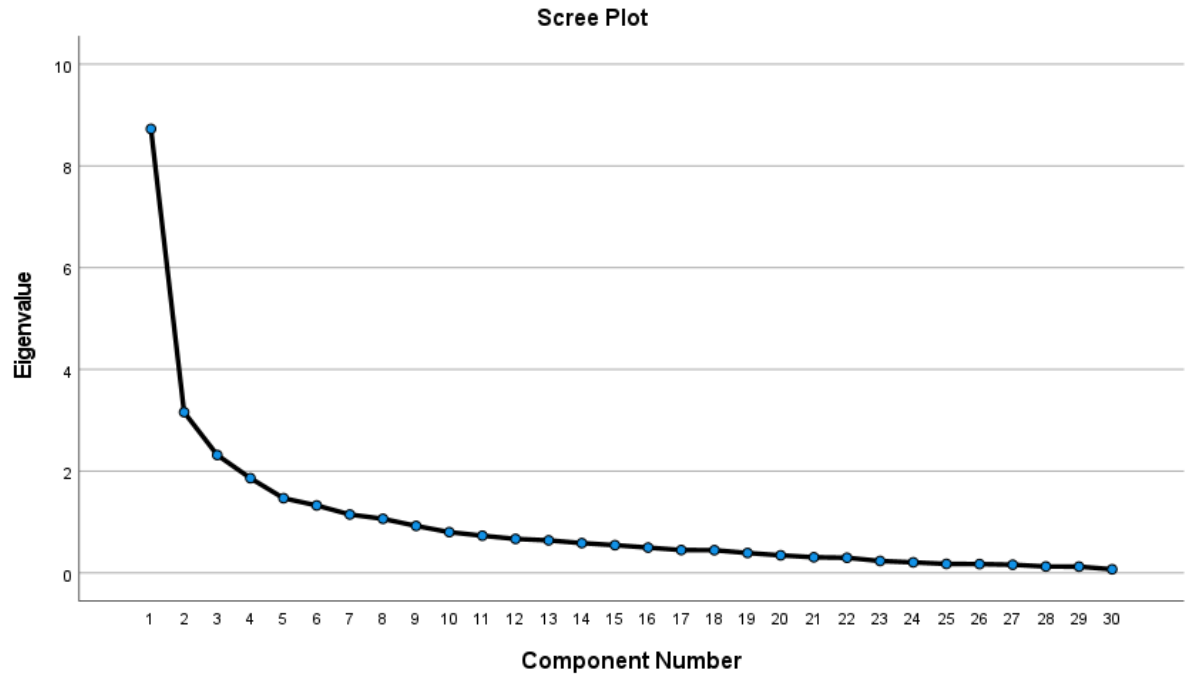


Table 2: FAILED PCS LOADINGS

	Component							
	1	2	3	4	5	6	7	8
VDCQ_A3_I find it easier to cope with my voice problem if I make myself think that I do not have a problem	**.741**	-.157	-.004	-.033	.317	.059	.047	-.052
VDCQ_A1_I find it easier to cope with my voice problems by involving myself in activities unrelated to singing (eg: playing a musical instrument)	**.739**	.003	.018	-.039	-.107	-.021	-.039	-.216
VDCQ_S27_Resting my voice at times, helps me cope with my voice problem.	**.734**	.176	.079	.163	-.127	-.092	.027	.218
VDCQ_A2_I tend to resort to home remedies when I have a voice problem	**.700**	.023	.069	-.027	-.121	.025	-.238	.091
VDCQ_S11_I find it easier to cope with my voice problem by telling myself not to think about it.	**.462**	.067	-.064	.185	.229	.035	-.143	-.208
VDCQ_S19_I find it easier to cope with my voice problem by finding out as much about it as I can.	.026	**.778**	.050	-.149	-.195	.012	-.247	-.060
VDCQ_S18_I try to find as much information as possible about my voice problem.	.064	**.699**	.101	-.095	-.188	-.086	-.255	-.075
VDCQ_S4_I keep any worries I may have about my voice problem to myself.	-.037	**.677**	-.226	.150	.084	.165	.149	.030
VDCQ_S23_I keep my frustrations to myself, so few of my friends know I am frustrated.	.025	**.618**	.153	.308	.241	-.261	-.005	.091
VDCQ_S24_I try to convince myself that my voice problem is not really that disabling.	.309	**.403**	.052	-.042	.181	.215	-.031	-.231

	Component							
	1	2	3	4	5	6	7	8
VDCQ_S2_I find it easier to cope with my voice problem by expressing my feelings outwardly.	.123	-.089	**.908**	-.021	-.038	.097	.035	.067
VDCQ_S3_I find talking with friends and family about my voice problem helpful.	.011	-.204	**.792**	-.092	.107	.035	-.226	-.149
VDCQ_S1_It helps me to cope with my voice problem if other people are sympathetic.	-.132	.240	**.731**	.112	-.003	-.204	.066	-.016
VDCQ_S10_I find it easier to cope with my voice problem by avoiding being with people in general.	.005	-.035	-.172	**.693**	-.142	-.075	-.360	-.161
VDCQ_S9_I try to avoid situations where my voice problem would become evident.	.017	.132	.177	**.662**	-.002	.127	-.129	.088
VDCQ_S15_I find myself wishing that I never had a voice problem.	.253	.124	.067	**.535**	.146	-.049	-.048	-.061
VDCQ_S13_I find it easier to cope with my voice problem wishing that it would go away or somehow be over with.	.349	-.038	-.043	**.493**	.256	.258	.095	-.100
VDCQ_S26_I ignore my voice problem by looking at only the good things in life	.460	-.033	.047	-.088	**.606**	.134	-.151	-.022
VDCQ_S6_I find it easier to cope with my voice problem if I ask the doctor questions about.	.149	.076	.277	-.073	**-.576**	.346	.040	-.140
VDCQ_S22_I cope better with my voice problems by trying to accept it, since nothing can be done.	.053	.412	.127	-.066	**.492**	.200	-.052	-.240
VDCQ_S12_I take the view that there is little I can do about my voice problem.	-.049	-.106	.166	.367	**.489**	.273	.166	-.227
VDCQ_S7_When my voice gets bad, I find myself taking it out on others around me.	.066	.071	.229	.314	-.352	-.173	.005	-.288

	Component							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
VDCQ_S8_I find religion and praying to God help me to cope with my voice problem.	.075	.119	.001	.179	-.006	**.752**	-.048	.008
VDCQ_S16_I find it easier to live with my voice problem, if I do not use my voice.	.261	.129	.109	.366	-.028	**-.584**	.104	-.192
VDCQ_S25_Having a voice problem has helped me develop into a better person.	.103	.051	-.049	.008	.151	-.011	**-.857**	-.063
VDCQ_S5_Having a voice problem has helped me to find some important truth about my life.	-.016	.092	.158	.239	-.023	.113	**-.742**	.092
VDCQ_S21_I find it easier to cope with my voice problem by joking about it.	-.029	.049	.057	-.188	.044	-.168	.016	**-.870**
VDCQ_S14_I ask people to help me with those things I cannot manage because of my voice problem.	-.017	-.138	.134	.294	-.183	.073	-.159	**-.607**
VDCQ_S20_I find it easy to cope with my voice problem when I compare myself to other people who have worse health problems.	-.009	.068	.009	.219	.168	.170	-.043	**-.566**
VDCQ_S17_I try to become involved in as many physical activities as possible to take my mind off my voice problem.	.300	.087	-.049	.179	-.250	.243	.091	**-.435**
Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization								
The numbers in bold indicate items which fit within the factor								

Table 3: Mapping process of VDCQ items based on established measures such as WAYS OF COPING CHECKLIST, WAYS OF COPING , COPE AND VDCQ-15

The VDCQ items were mapped based on the WAYS of coping checklist, WAYS if coping questionnaire, COPE and the VDCQ-15 subscales. Some of the items appeared in more than one measure under similar/different subscales. A consensus was sought following discussion with the supervisors and the appropriate subscale was chosen for that item.

VDCQ ITEMS	WAYS OF COPING CHECKLIST	WAYS OF COPING QUESTIONNAIRE	COPE	VDCQ
1. It helps me to cope with my voice problem if other people are sympathetic.	SEEKING SOCIAL SUPPORT		SEEKING EMOTIONAL SOCIAL SUPPORT	SOCIAL SUPPORT
2. I find it easier to cope with my voice problem by expressing my feelings outwardly.	CONFRONTIVE COPING	SEEKING SOCIAL SUPPORT	VENTING OF EMOTIONS	SOCIAL SUPPORT
3. I find talking with friends and family about my voice problem helpful.	SEEKING SOCIAL SUPPORT	SEEKING SOCIAL SUPPORT	SEEKING EMOTIONAL SOCIAL SUPPORT	SOCIAL SUPPORT
4. I keep any worries I may have about my voice problem to myself.	SELF-CONTROLLING	KEEP TO SELF		SOC SUPPORT
5. Having a voice problem has helped me to find some important truth about my life.	POSITIVE-REAPPRAISAL	FOCUSING ON THE POSITIVE	POSITIVE REINTERPRETATION AND GROWTH	SOC SUPPORT
6. I find it easier to cope with my voice problem if I ask the doctor questions about.	SEEKING SOCIAL SUPPORT	SEEKING SOCIAL SUPPORT	SEEKING INSTRUMENTAL SOCIAL SUPPORT	SOC SUPPORT
7. When my voice gets bad, I find myself taking it out others around me.	ESCAPE AVOIDANCE		VENTING OF EMOTIONS	
8. I find religion and praying to God help me to cope with my voice problem.	POSITIVE REAPPRAISAL	SEEKING SOCIAL SUPPORT	TURN TO RELIGION	

9. I try to avoid situations where my voice problem would become evident.				AVOIDANCE
10. I find it easier to cope with my voice problem by avoiding being with people in general.	ESCAPE AVOIDANCE	KEEP TO SELF		AVOIDANCE
11. I find it easier to cope with my voice problem by telling myself not to think about it.	DISTANCING			PASSIVE
12. I take the view that there is little I can do about my voice problem.			ACCEPTANCE	PASSIVE
13. I find it easier to cope with my voice problem wishing that it would go away or somehow be over with.	ESCAPE AVOIDANCE	WISHFUL THINKING		PASSIVE
14. I ask people to help me with those things I cannot manage because of my voice problem.	SEEKING SOCIAL SUPPORT			
15. I find myself wishing that I never had a voice problem.	ESCAPE AVOIDANCE			PASSIVE
16. I find it easier to live with my voice problem, if I do not use my voice.				AVOIDANCE
17. I try to become involved in as many physical activities as possible to take my mind off my voice problem.		TENSION REDUCTION	MENTAL DISENGAGEMENT	
18. I try to find as much information as possible about my voice problem.	PLANFUL PROBLEM SOLVING			INFO SEEKING
19. I find it easier to cope with my voice problem by finding out as much about it as I can.	PLANFUL PROBLEM SOLVING			INFO SEEKING
20. I find it easy to cope with my voice problem when I compare myself to other people who have worse health problems.	DISTANCING	FOCUSING ON THE POSITIVE	POSITIVE REINTERPRETATION AND GROWTH	
21. I find it easier to cope with my voice problem by joking about it.	DISTANCING		HUMOUR	
22. I cope better with my voice problems by trying to accept it, since nothing can be done.			ACCEPTANCE	
23. I keep my frustrations to myself, so few of my friends know I am frustrated.	SELF-CONTROLLING	KEEP TO SELF		

24. I try to convince myself that my voice problem is not really that disabling.	DISTANCING	FOCUSING ON THE POSITIVE	POSITIVE REINTERPRETATION AND GROWTH	
25. Having a voice problem has helped me develop into a better person.	POSITIVE REAPPRAISAL	FOCUSING ON THE POSITIVE	POSITIVE REINTERPRETATION AND GROWTH	
26. I ignore my voice problem by looking at only the good things in life	DISTANCING	FOCUSING ON THE POSITIVE	POSITIVE REINTERPRETATION AND GROWTH	
27. Resting my voice at times, helps me cope with my voice problem.	PLANFUL PROBLEM SOLVING	TENSION REDUCTION		
28. I find it easier to cope with my voice problems by involving myself in activities unrelated to singing (eg: playing a musical instrument)			MENTAL DISENGAGEMENT	
29. I tend to resort to home remedies when I have a voice problem	PLANFUL PROBLEM SOLVING			
30. I find it easier to cope with my voice problem if I make myself think that I do not have a problem	ESCAPE AVOIDANCE DISTANCING	DETACHMENT	DENIAL	

Appendix 6.8: Frequency of variables believed to negatively impact voice as reported by Western classical and Carnatic singers

Symptom	WC		Carnatic	
	No	Yes	No	Yes
Consuming alcohol	29	34	75	27
Consuming Caffeine	44	19	88	14
Colds/Allergies	37	26	71	31
Consuming Contraceptives	57	6	97	5
Crossover singing	53	10	86	16
Consuming Dairy	46	17	91	11
Lack of Faith in God	59	4	92	10
Lack of Voice rest	29	34	61	41
Lack of Warmup	35	28	74	28
Medications	47	16	87	15
Menopause	49	14	94	8
Menstruation	47	16	91	11
Negative Attitude towards voice	38	25	72	30
Consuming Oily food	56	7	77	25
Oversinging/speaking	31	32	63	39
Performance Anxiety	28	35	58	44
Lack of Physical Exercise	39	24	80	22
PMS	47	16	93	9
Poor Acoustics	49	14	76	26
Lack of regular singing practice	40	23	61	41
Consuming Refrigerated items	58	5	76	26
Lack of Sleep	19	44	60	42
Consuming spicy food	52	11	80	22
Stress	25	38	56	46
Consuming Tobacco	40	23	75	27
Travel	43	20	87	15
Unhealthy body weight	47	16	83	19

Appendix 6.9: Mann Whitney U test results comparing the scores between the two groups of subscales which produced a significant result on the Shapiro-Wilk test indicating non-normality

		Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p
Vocal performance problems	WC	76.98	4850.00	2834	-1.273	0.203
	Carnatic	86.72	8845.00			
Acoustic inadequacies	WC	70.10	4416.50	2400.5	-2.729	0.006
	Carnatic	90.97	9278.50			
SVHI-Auditory Perceptual	WC	57.81	3642.00	1626	-5.326	<.001
	Carnatic	98.56	10053.00			
SVHI-Vocational	WC	78.17	4924.50	2908.5	-1.03	0.303
	Carnatic	85.99	8770.50			
SVHI-Emotional	WC	76.00	4788.00	2772	-1.481	0.139
	Carnatic	87.32	8907.00			
VDCQ-Information seeking	WC	95.46	6014.00	2428	-2.641	0.008
	Carnatic	75.30	7681.00			
	Carnatic	83.46	8513.00			

Appendix 6.10: t-test results of the percentage scores of SVHI subscales between the groups

Subscale	WC		Carnatic		Inferential statistics			
	Mean	SD	Mean	SD	t	p	CI-lower	CI-upper
SVHI Total %	22.39	15.51	29.02	16.35	-2.58	0.01	-11.70	-1.55
SVHI Auditory perceptual %	19.11	13.37	33.96	17.13	-5.87	<.001	-19.85	-9.85
SVHI Functional %	17.18	15.53	24.52	19.03	-2.58	0.01	-12.97	-1.71
SVHI Vocational %	20.78	22.93	23.11	20.87	-0.67	0.50	-9.19	4.53
SVHI Emotional %	22.92	22.51	27.50	21.72	-1.30	0.20	-11.54	2.40
SVHI Consistency %	29.24	19.95	33.57	21.12	-1.31	0.19	-10.87	2.22

Appendix 6.11: Mann Whitney U results of all the variables which are believed to impact voice

	Mann-Whitney U	p
Lack of Sleep	2292	<.001
Consuming Alcohol	2329.5	<.001
Consuming Tobacco	2890.5	0.174
Consuming Caffeine	2685	0.011
Consuming Dairy	2692.5	0.007
Consuming Spicy food	3081	0.523
Consuming Oily food	2782.5	0.035
Consuming Refrigerated items	2649	0.005
Unhealthy body weight	2995.5	0.303
Lack of Physical Exercise	2682	0.022
Travel	2665.5	0.01
PMS	2680.5	0.004
Menstruation	2743.5	0.014
Menopause	2751	0.008
Using contraceptives	3064.5	0.249
Colds/Allergies	2863.5	0.155
Medications	2869.5	0.089
Stress	2724	0.058
Performance Anxiety	2814	0.122
Crossover singing	3207	0.975
Oversinging/speaking	2809.5	0.115
Lack of Voice rest	2770.5	0.085
Negative Attitude	2883	0.175
Lack of Warmup	2667	0.026
Practice	3094.5	0.638
Lack of Faith in God	3102	0.44
Poor Acoustics	3108	0.635

Appendix 7.1: Correlations between other variables and SVHI-outcomes

CORRELATIONS BETWEEN SELF-ATTRIBUTES USED BY SINGERS TO DESCRIBE THEIR OWN VOICES AND SVHI OUTCOMES

	SVHI_Mean	SVHI_Aud_Percep	SVHI_Functional	SVHI_Vocational	SVHI_Emotional	SVHI_Consistency
Big/Loud	-0.105	-0.218	-0.075	0.008	-0.107	-0.134
Openthroated	-0.169	-0.164	-0.147	-0.095	-0.173	-0.146
Warm	-0.098	-0.068	-0.162	-0.035	-0.058	-0.134
Silvery	-0.087	-0.190	-0.001	-0.050	-0.006	-0.026
Gold	-0.162	-0.209	-0.052	-0.081	-0.084	-0.165
Steady	-0.165	-0.112	-0.191	-0.119	-0.047	-0.173
Solid	-0.204	-0.245	-0.178	-0.145	-0.170	-0.201
Expressive	-0.104	-0.175	-0.146	-0.045	-0.082	-0.099
Wide-Ranged	-0.240	-0.249	-0.215	-0.181	-0.189	-0.159
Sweet	-0.106	-0.081	-0.136	-0.114	-0.074	-0.148
Melodious	-0.149	-0.055	-0.139	-0.138	-0.104	-0.104
Nasal	0.188	0.195	0.146	0.158	0.072	0.193
Husky	0.095	0.130	0.147	0.119	0.066	0.119

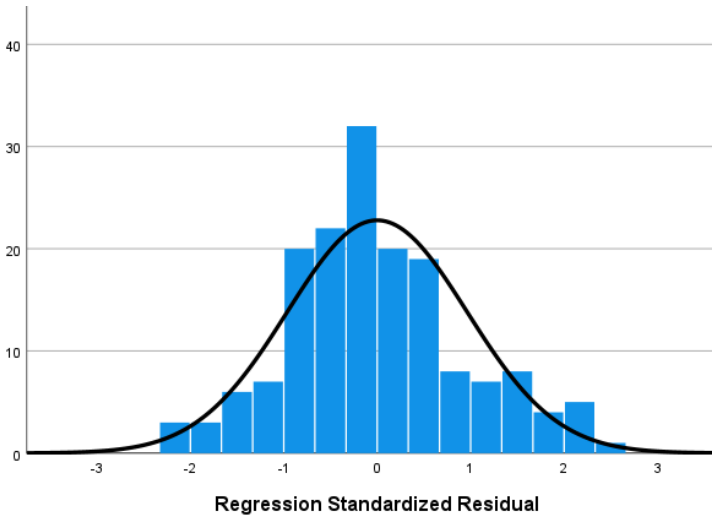
CORRELATION BETWEEN BELIEFS/PERCEPTIONS REGARDING FACTORS IMPACTING VOICE AND SVHI OUTCOMES

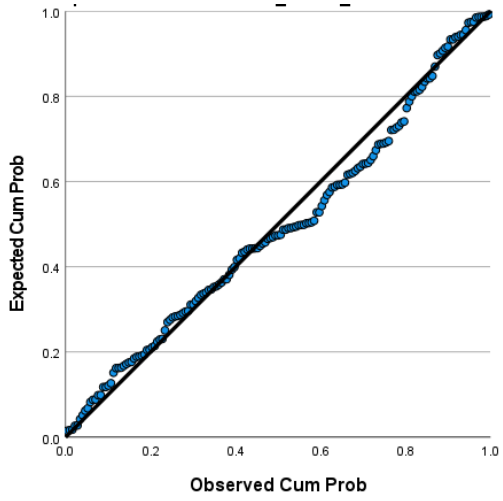
	SVHI_Mean	SVHI_Aud_Percep	SVHI_Functional	SVHI_Vocational	SVHI_Emotional	SVHI_Consistency
Lack of Sleep	-0.119	-0.157	-0.169	-0.119	-0.052	-0.012
Consuming Alcohol	-0.142	-0.239	-0.151	-0.106	-0.043	-0.059
Consuming Tobacco	-0.133	-0.174	-0.175	-0.128	-0.057	-0.036
Consuming Caffeine	0.024	-0.043	-0.042	0.038	0.069	0.060
Consuming Dairy	-0.003	-0.107	-0.041	0.010	0.044	0.074
Consuming Spicy food	0.065	0.022	-0.003	0.084	0.046	0.123
Consuming Oily food	-0.028	0.031	-0.066	-0.035	-0.075	0.036
Consuming Refrigerated items	0.048	0.059	-0.002	0.048	0.029	0.062

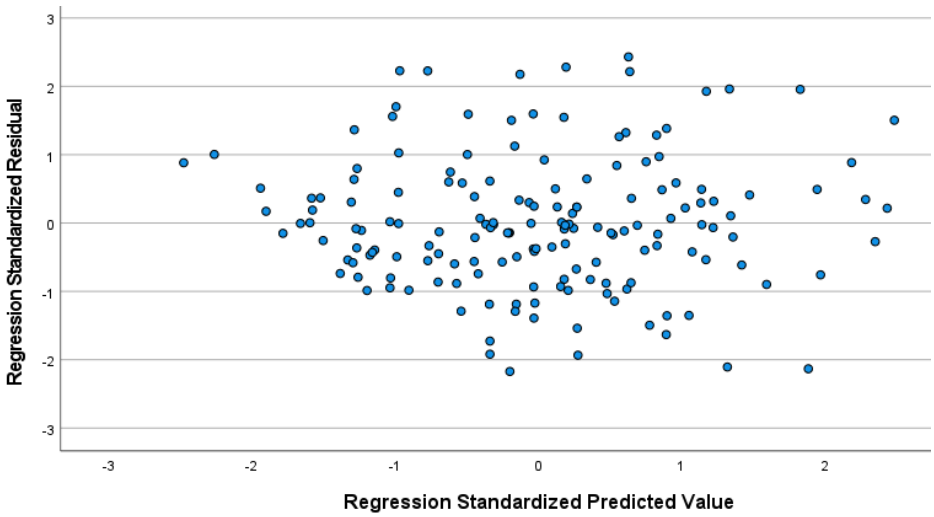
	SVHI_Mean	SVHI_Aud_Percep	SVHI_Functional	SVHI_Vocational	SVHI_Emotional	SVHI_Consistency
Unhealthy body weight	0.036	-0.027	-0.022	0.072	0.061	0.060
Lack of Physical Exercise	-0.074	-0.114	-0.108	-0.032	-0.045	-0.004
Travel	-0.015	-0.152	-0.070	0.024	0.034	0.097
PMS	0.009	-0.172	-0.052	0.090	0.091	0.082
Menstruation	0.062	-0.106	-0.033	0.119	0.126	0.139
Menopause	0.144	-0.032	0.096	0.147	0.217	0.146
Using contraceptives	0.019	-0.035	-0.064	0.092	0.062	0.020
Colds/Allergies	-0.015	-0.063	-0.115	0.000	0.017	0.080
Medications	0.081	-0.067	-0.013	0.146	0.133	0.126
Stress	-0.048	-0.116	-0.111	-0.080	0.017	0.063
Performance_Anxiety	0.092	-0.012	0.004	0.033	0.159	0.156
Crossover singing	0.041	-0.013	0.013	0.092	0.036	0.054
Oversinging/speaking	0.123	0.030	0.042	0.076	0.124	0.222
Lack of Voice rest	-0.053	-0.124	-0.115	-0.067	-0.004	0.074
Negative Attitude	0.055	-0.064	-0.014	0.055	0.124	0.100
Lack of Warmup	0.101	-0.039	0.012	0.062	0.159	0.191
Practice	0.043	-0.004	-0.027	-0.026	0.053	0.154
Lack of Faith in God	0.013	0.040	-0.020	-0.006	0.034	-0.005
Poor Acoustics	0.033	-0.048	-0.037	0.042	0.076	0.087
Other	0.046	-0.029	0.025	0.130	0.076	0.007

Appendix 7.2: Relevant charts of multiple regression indicating fulfilment of pre-requisites

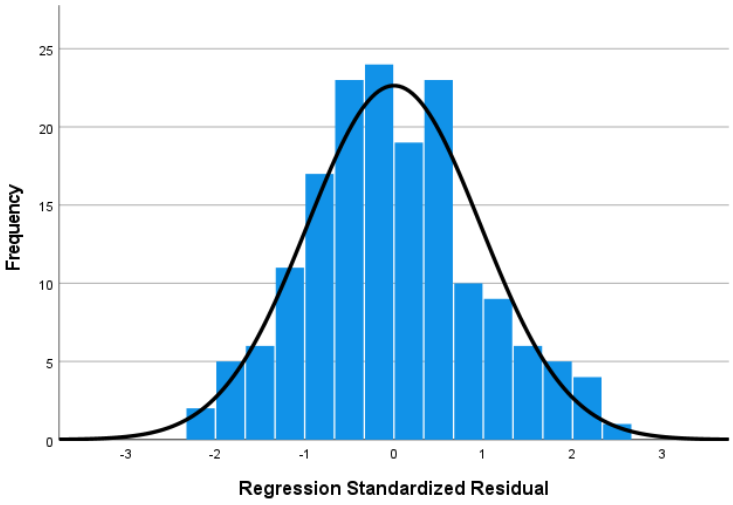
SVHI-MEAN--HISTOGRAM, P-P PLOT AND SCATTERPLOT

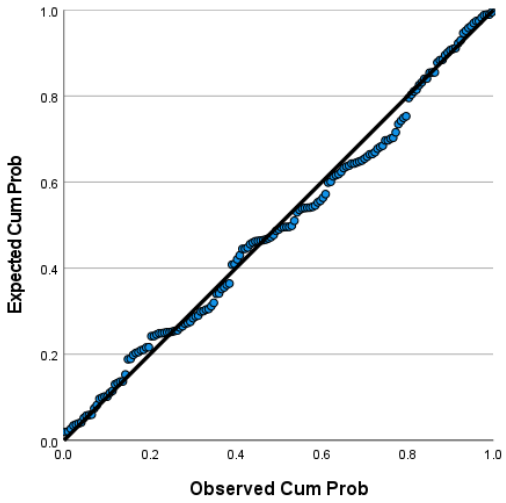


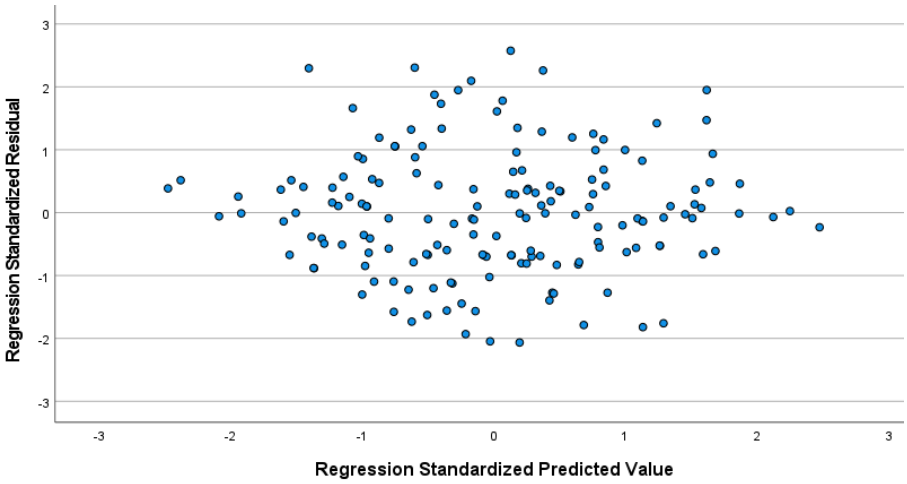




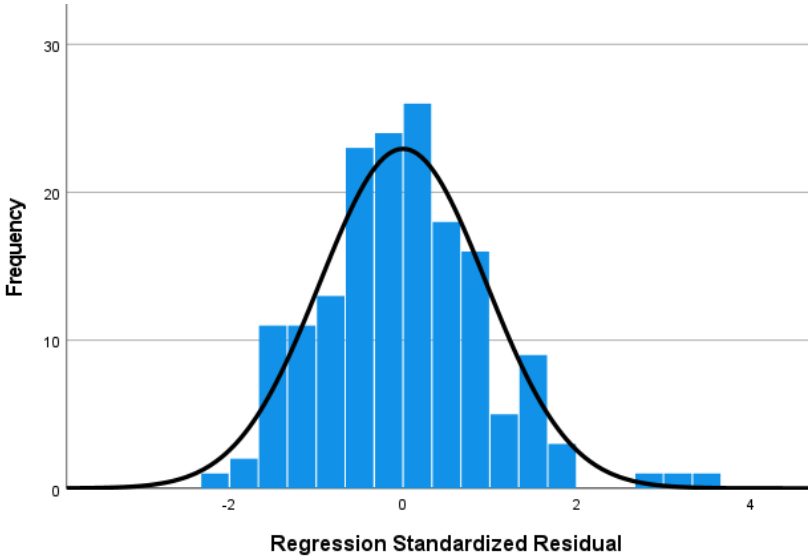
SVHI-AUDITORY PERCEPTUAL-HISTOGRAM, P-P PLOT AND SCATTERPLOT

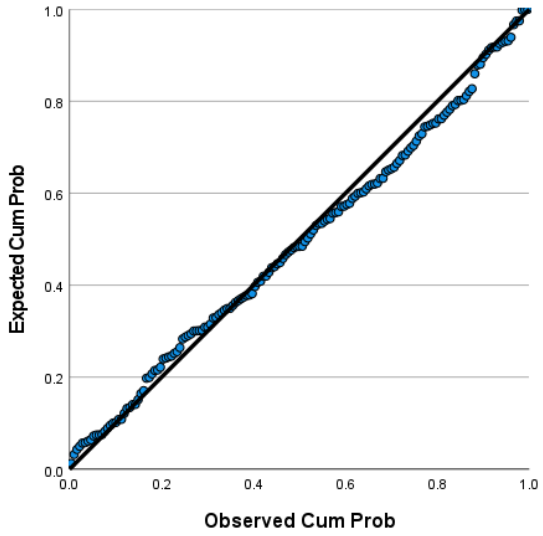


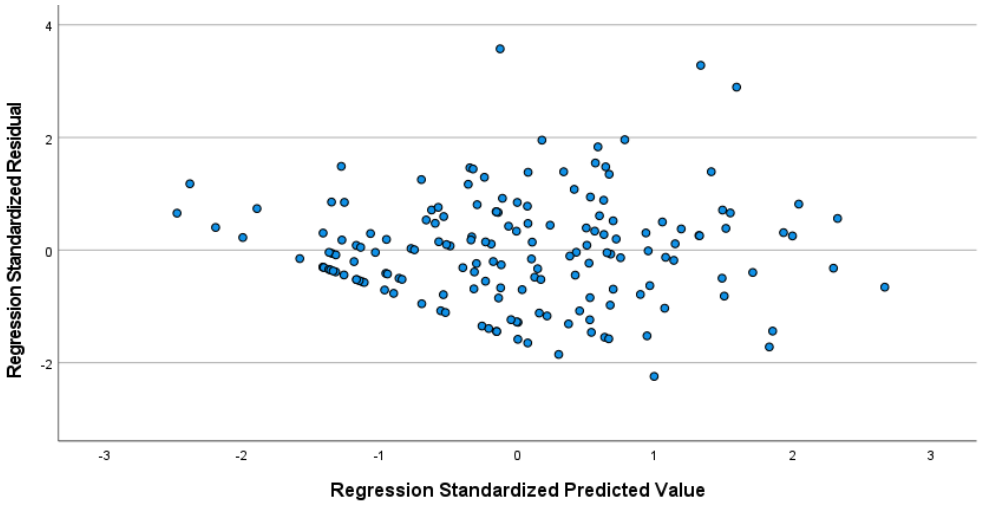




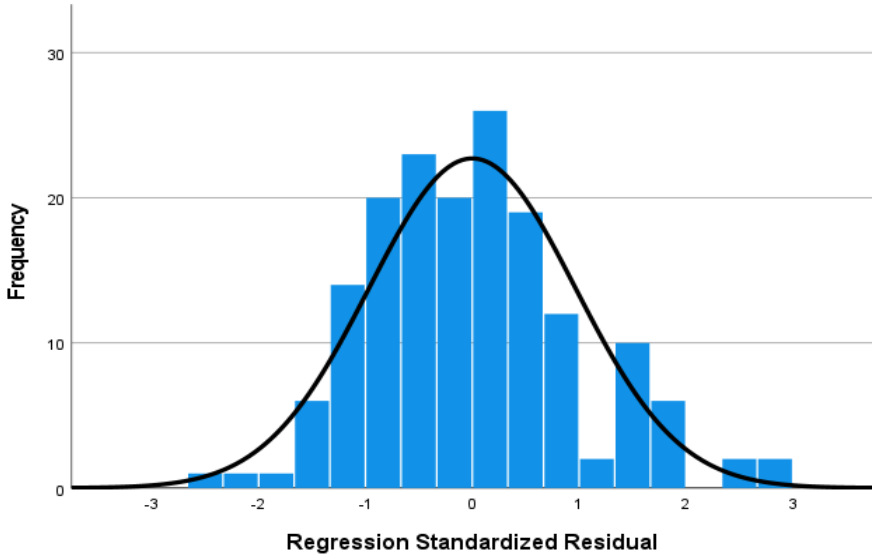
SVHI-FUNCTIONAL-HISTOGRAM, P-P PLOT AND SCATTERPLOT

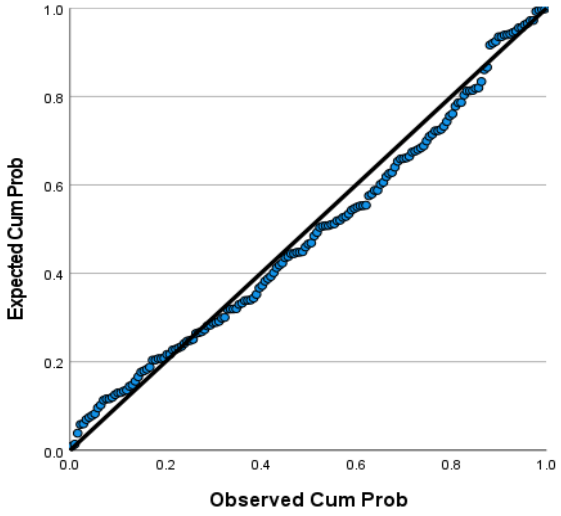




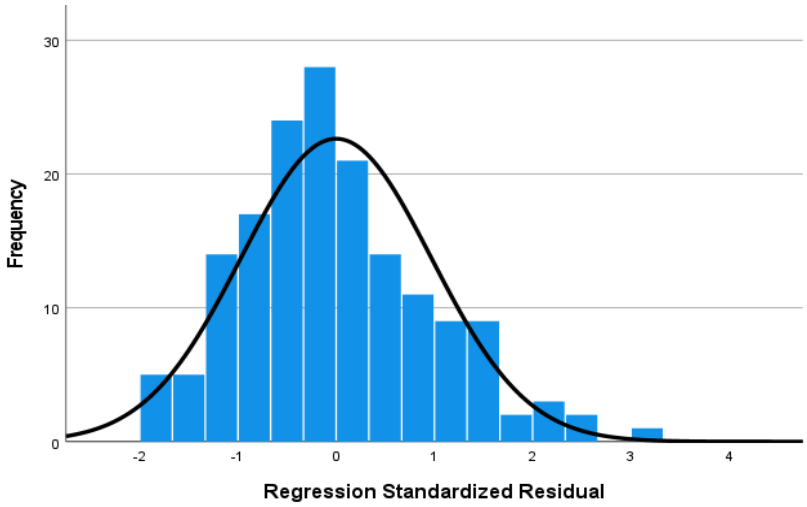


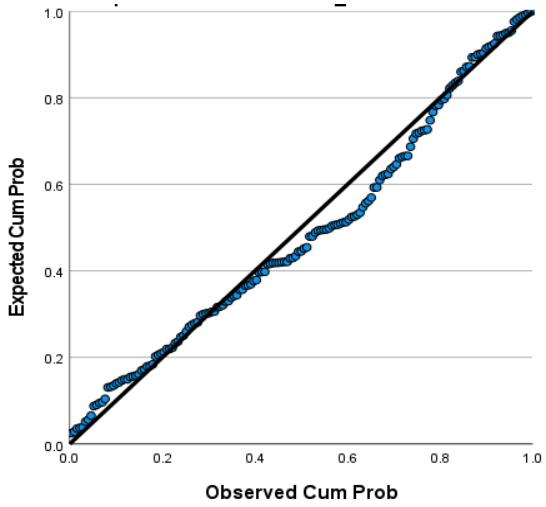
SVHI-VOCATIONAL-HISTOGRAM, P-P PLOT AND SCATTERPLOT

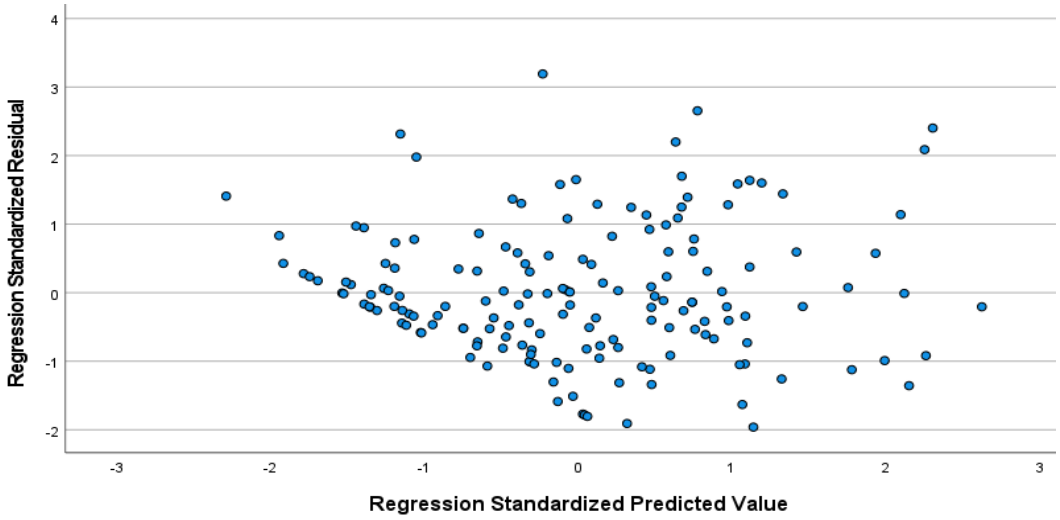




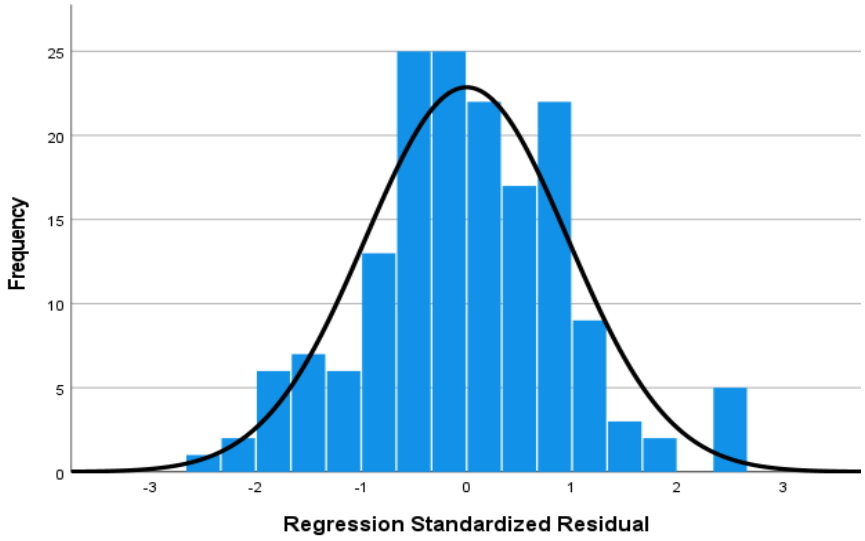
SVHI-EMOTIONAL-HISTOGRAM, P-P PLOT AND SCATTERPLOT

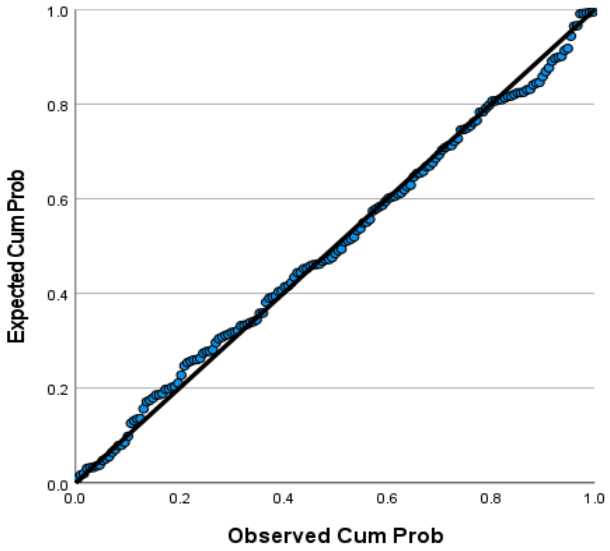


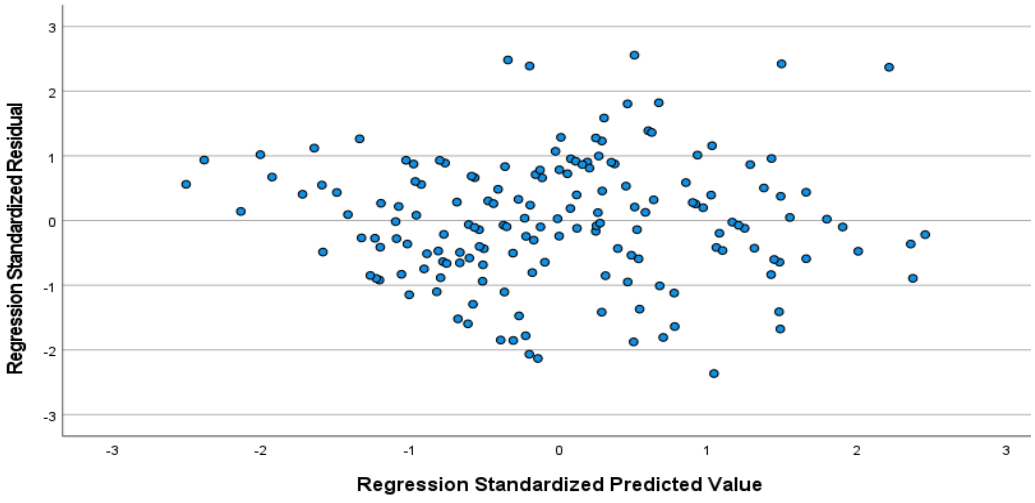




SVHI-CONSISTENCY-HISTOGRAM, P-P PLOT AND SCATTERPLOT







Appendix 8.1: Correlation matrix showing relationships between VDCQ and IPQ subscales

	IPQ Impact	IPQ Timeline	IPQ Control	IPQ Treatment control	IPQ Symptoms	IPQ Concern	IPQ Comprehension	IPQ Emotional
VDCQ Social	.255**	.224***	-0.049	0.095	.247**	.253**	0.110	.357***
VDCQ Keep to self	.313***	.297***	-.167*	0.105	.241**	.205**	-0.003	0.122
VDCQ Positive Reappraisal	.304***	.275***	-0.037	-0.002	.194*	.289***	0.130	.335***
VDCQ Escape Avoidance	.566***	.335***	-.185*	0.059	.405***	.484***	-0.005	.498***
VDCQ Distancing	.244**	.225**	-.173*	-0.059	.239**	.305**	0.027	.326**
VDCQ Info seeking	.280***	0.135	0.078	.157*	.214**	.211**	0.140	.284***
VDCQ Tension reduction	.308***	0.147	0.026	.155*	.250**	.343***	0.084	.400***
VDCQ Religion	0.088	-0.121	0.008	0.084	0.058	0.169	0.054	0.066
VDCQ Home remedies	.276**	0.129	-0.032	0.102	.253**	.360***	0.042	.342***