

Keeping the Voice Fit in the Group Fitness Industry: A Qualitative Study to Determine What Instructors Want in a Voice Education Program

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Summary: Objectives. This study aimed to provide a descriptive summary of (1) group fitness instructors' (GFIs') experiences of occupational voice use and education, and (2) the content and mode of delivery desired by GFIs in an education and training program.

Study Design. This is a qualitative inductive approach using a semi-structured interview.

Method. Semi-structured interviews were conducted with eight GFIs recruited via self-selection sampling. Participants were asked to comment on their experiences of voice use, voice education, and their preferences for future education and training.

Result. Participants reported experiencing occupational voice difficulties, and cited inadequate voice education, faulty equipment, and apathetic fitness industry attitudes as core barriers to vocal health. Content focusing on vocal hygiene, safe occupational voice use, use of amplification equipment, and addressing industry attitudes to voice was desired by participants. A combination of face-to-face, web-based, and app-based delivery options was suggested.

Conclusion. The data from this study should be considered when designing a vocal education and training package tailored to the needs of GFIs and the fitness industry.

Key Words: Occupational voice use–Group fitness instructor–Aerobics instructor–Vocal hygiene–Voice education.

INTRODUCTION

Group fitness instructors (GFIs) rely on their voices to motivate, engage, communicate with, and provide fitness education to class participants. However, voice disorders are prevalent in this occupational group, with 44%–70% of GFIs reporting some degree of acute or chronic voice change since joining the fitness industry.^{1–4} Voice difficulties in GFIs can negatively influence work performance, work efficiency, and psychosocial well-being,^{2,3,5–7} with previous research indicating that half of GFIs with voice difficulties report social withdrawal, decreased job satisfaction, and emotional distress related to their difficulties.⁵ In response to these impairments, activity limitations, and participation restrictions, researchers have called for a systematic education and training approach that is tailored to the demands of the GFI profession.^{2–4,8} Similarly, 98% of GFIs⁴ have indicated that they would like formal, standardized voice education.^{4,5} Despite this, there appears to be no uniform approach to voice education and training.^{2–5}

Voice education and training programs have been shown to be successful in reducing voice disorder and difficulty in professional and occupational voice users, and preventing new-onset voice disorders in vocally healthy individuals.^{9–12} However, these programs cannot be directly used with GFIs, as the vocal demands of the occupation are both complex and unique. While instructing, GFIs must engage in extended periods of simultaneous exercise and voice use. This may culminate in increased phonatory effort owing to exercise-related changes in respira-

tory and laryngeal function.¹³ GFIs' voices may also have to compete with environmental noise (eg, loud music, air-conditioning and fans, participant noise) in large spaces with poor acoustics.⁴

Prevention of occupational voice disorders (ie, voice impairments whose pathogenesis is primarily related to occupational voice use and may impair job performance)¹⁴ requires a proactive and systematic approach to education and training that involves all industry stakeholders (ie, industry leaders, workplace management, health professionals, and instructors).^{5,15} Changing the culture surrounding voice education and training in the fitness industry begins with gaining a greater understanding of the perspectives of GFIs relating to occupational voice use and voice care. It is important to capture these preferences, as it allows for future intervention to be consumer led. Health-care consumers are increasingly becoming more active and empowered participants in health-care decision-making.¹⁶ By ensuring that health care is designed and implemented in response to the consumer's experience, health-care professionals can add value in their service for the consumer.¹⁷ To date, all studies conducted have used survey methodology and, thus, the accounts of GFI experiences and opinions captured have been somewhat limited. This has meant that, although the need for intervention with this population has been repeatedly identified, data that explicitly report the preferences of GFIs for a voice prevention or intervention service do not currently exist. Therefore, this study used qualitative research design to (1) explore GFIs' experiences of occupational voice use, and current industry voice education and training, and (2) identify the preferences of GFIs with regard to the content and delivery of a voice education and training program tailor made for the fitness industry. It is hoped that by directly consulting GFIs as health-care consumers, the information gathered in the study will aid the development of evidence-based, client-centered approaches to intervention.

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METHOD

Participants

Eight participants, one man and seven women, aged between 24 and 44 years were recruited to this study. Group fitness instruction served as either their primary (12.5%) or their secondary (87.5%) occupation, with four states and two territories across Australia being represented (Table 1). All participants were earning income from teaching between 3 and 12 group fitness classes per week, with four respondents reporting that they were employed to cover additional classes each week, ranging between one and three cover classes. The range of days per week participants instructed was between 4 and 7, with participants teaching between one and two classes per day. Participants who reported teaching more than one class consecutively reported they did this between one and six times per week. Participants had been earning income as fitness instructors for 2–20 years, with four of the eight participants reporting they had experienced problems with their voice or voice changes since entering the group fitness industry.

Procedure

To address the study aims, a qualitative inductive descriptive research design was used. All participants were recruited through self-selected sampling via an online GFI-focused message board. GFIs were eligible to participate if they were (1) aged 18 or older; (2) currently working as a GFI as either a primary or a secondary source of income; (3) currently employed as a GFI in

Australia; and (4) had the ability to participate in a semi-structured interview in English. Participants were not included or excluded from the study based on their previous or current vocal health status. When GFIs reported voice impairment, activity limitation, and participation restriction, these were not formally investigated or quantified (eg, through administration of a psychosocial rating tool) as this did not align with the aims of the study. Recruitment (conducted by A.F.R.) occurred over a 3-week period in May 2016. Following recruitment into the study, participants completed a consent form and an online pre-interview questionnaire. Participants were also provided with a topic guide (see Appendix 1) to assist with their preparation and facilitate self-reflection before the interview. Each participant, at a scheduled convenient time, took part in a semi-structured phone interview with one of the study authors (A.F.R.). Ethical approval for this study was obtained from The University of Queensland Behavioural and Social Sciences Ethical Review Committee (approval number: 2015001789).

Preinterview questionnaire

Before interview participation, participants were provided with a link to a brief online questionnaire self-administered via Toluna QuickSurveys (www.quicksurveys.com). Questions were open ended and gathered information about biographical information and demographics, group fitness instruction history, current instruction frequency (ie, number of classes per week), current instruction patterns (ie, whether multiple classes are taught per

TABLE 1.
Participant Demographics

#	Age	Gender	Location	Primary Occupation	Years in Industry	Group Fitness Programs Taught	Average # of Classes per Week	Voice Change Reported
1	31	F	VIC	Research assistant	5	BodyCombat, BodyPump, BodyJam	5P, 1C	No
2	34	F	VIC	Travel agent (owner or operator)	10	BodyCombat, BodyStep, BodyPump, RPM, Boxing, Freestyle	6P, 2C	No
3	24	F	ACT	Public servant	2	Grit Strength, Grit Plyo, Grit Cardio, BodyBalance	3P, 3C	No
4	36	F	WA	Environmental health officer	12	BodyCombat, BodyPump	6P	Yes
5	39	M	NT	Police officer	20	BodyPump, BodyAttack, CXWORX, RPM, Sprint, Grit Strength, Grit Plyo, Grit Cardio	8–12P	Yes
6	44	F	NSW	Police officer	15	Combat, Freestyle Circuit, Boxing, Freestyle Spin, PT	3P, 2C	Yes
7	35	F	NSW	GFI	20	Zumba, Aqua Zumba, Aqua Fitness, Instructor Training	4P	No
8	28	F	QLD	GFI/Dance artist	4	Barre Body (Pilates, Barre, Yoga), Yoga	11P	Yes

Abbreviations: F, female; M, male; GFI, group fitness instructor; ACT, Australian Capital Territory; NSW, New South Wales; NT, Northern Territory; QLD, Queensland; WA, Western Australia; CXWORX, core workout fitness class; PT, personal training; RPM, raw power in motion cycling fitness class; P, permanent; C, cover.

day and whether these are done without a break occurring in between classes), current instruction type (ie, type of exercise undertaken during a class), and whether they had noticed any vocal problems or changes since entering the group fitness industry (see [Appendix 2](#)). Information gathered via the online questionnaire was verified with participants at the commencement of the semi-structured interview.

Semi-structured interview

The topic guide was used to direct the interview, ensuring that all the key topic areas were addressed in each interview. During interviews, questions were adapted, omitted, or elaborated on depending on the individual participants and their responses. This was done to avoid limiting participant freedom of response and to maintain a conversational style.

Each participant took part in a semi-structured interview conducted over the phone. These interviews were audio-recorded with participant consent, with the duration of each interview ranging from 9.85 to 21.68 (median 17.12) minutes.

Data analysis

Data analysis was conducted over a 3-month period (June to August 2016). To ensure participant confidentiality, participants were de-identified and assigned a participant number (by A.F.R.). Audio recordings of participant interviews were transcribed verbatim (by P.J.A.) to ensure no information provided by the participants was lost in the generation of transcripts. Initially, the principal investigator familiarized himself with the data as a whole, through repeated readings of each transcript. Following this, the data were analyzed using the content analysis model proposed by Graneheim and Lundman.¹⁸ This model was employed to allow the data to be (1) organized in a meaningful structure that supports the identification of patterns and regularities, and (2) analyzed for its manifest properties without compromising the original form of the meaning unit.¹⁸

Codes were assigned to phrases identified as units of meaning within the transcripts, with codes generated being repeatedly reviewed and refined by P.J.A. during the analysis process. This code generation was completed to allow for the further analysis and categorization of each individual meaning unit within the context of the study. A.F.R. completed consensus coding by independently coding two interview transcripts using the list of categories. Following this step, some refinement of the list of categories took place, and all interviews were re-coded by P.J.A. using the revised categories. Subcategories were generated by the grouping of codes within transcripts based on semantic relationships, which then were grouped again into broader categories, and finally into overall themes (see [Appendix 3](#)). Following preliminary coding, peer checking was undertaken by A.F.R. for all generated subcategories, categories, and themes against coded extracts and the entire data set to ensure that data generated accurately reflected the meaning conveyed in data. Participants were sent a summary of the themes and categories identified from the analysis and were asked to confirm the investigators' interpretation of the interviews as a whole. No participants provided additional written feedback and all confirmed the interpretation of their experiences.

RESULTS

Two overarching themes emerged from the interviews. These captured the GFIs' experiences of occupational voice use and preferences for education and training. The first theme, "GFI experiences of occupational voice," described the experiences and perceptions of GFIs relating to voice use in the workplace. This theme contained two associated categories, "Voice use at work" and "Workplace barriers to vocal health," each with associated subcategories. The second theme, "Education preferences," identified the preferences and attitudes of GFIs relating to voice education. Associated with this theme were two categories, "content" and "delivery," each with associated subcategories. Examples of participant responses and associated subcategories can be found in [Table 2](#).

Theme 1: GFI experiences of occupational voice

Voice use at work

Across all interviews conducted, participants spoke of their personal experiences with "voice use at work." Comments included descriptions of their experiences of voice changes and difficulties since entering the industry, such as physical discomfort and pain following periods of voice use, difficulties with projection, vocal fatigue, and changes to vocal quality (ie, hoarseness).

The four GFIs who reported experiencing some voice change or difficulties described the behavioral changes they had made. These changes included decreasing or altering communication during classes (eg, using physical cues instead of vocal instruction), altering modal pitch, use of breathy voice, self-imposed vocal rest, self-treatment with home remedies, consumption of throat lozenges, and altering work schedules. Participants reported that they would seek a replacement instructor as a last resort, using other forms of compensation first (as described above) and continuing instruction despite experiencing vocal difficulties. GFIs stated that they perceived there to be pressure and expectations from exercise class participants and facility management to continue teaching when they were vocally compromised.

Beyond reporting experiences of difficulty and compensatory methods, GFIs reported that voice difficulties had a negative functional impact on their performance in their GFI role, as well as in their other occupations. GFIs reported that voice difficulties were a distraction when instructing, and that exercise participants may be less engaged, have reduced enjoyment, and have reduced ability to understand instructions during classes run by a GFI with voice difficulties.

These reports coincided with GFIs stating that they were concerned about the difficulties they had experienced since working in the industry, and that they had noted concerns in their co-workers. They also stated that they were worried about the impact that voice problems have on their ability to continue working in the fitness industry and in other industries.

Although concerned about their own vocal health, GFIs said that they did not believe that voice difficulties were perceived as being representative of poor overall health. They did, however, report that class members became concerned on noticing their voice changes. They said that voice problems were often perceived by class members as acute illness (eg, a sore throat), and

TABLE 2.
Content Subcategories

Subcategories	Example Quotes From GFI Participants
Behavioral adaptations to voice difficulties	"I was trying all the grandma's remedies like honey and hot water and getting some Strepsils [lozenges]" (participant 1)
GFI experiences of occupational voice	"You get those funny like sounds, you [sic] very low and then at some stage it just goes into very, very high pitch which makes people laugh" (participant 1)
Training limitations impacting voice	"I don't think it [voice education] is anywhere in any part of anyone's training that any of us do, and I think it's important. It should be done" (participant 2)
Equipment barriers	"In the part where the microphone was just not working properly I found my voice was really struggling or suffering" (participant 4)
Voice education content	"All group fitness instructors should learn more about - about how to effectively use their voice without overusing it" (participant 7)
Equipment training content	"Use of the microphone so that everyone understands how to set the microphone in comparison with the volume of the music" (participant 4)
Treatment options for voice problems	"Can I have some little self-help things or do I need to seek professional assistance? What do I do next?" (participant 2)
Industry standardization of content	"I think it would be amazing if it [voice education] was kind of just more of the culture. So, like if it was part of your teacher training" (participant 8)
In-person delivery	"I think it's important to have human contact, and just having someone to interact with. I think we learn better that way" (participant 7)
Internet-based delivery	"I guess online is the best way to reach the maximum number of people" (participant 1)
App-based delivery	[On app-based reminders for vocal hygiene] "I think that's a really good idea, actually" (participant 4)

that they could potentially be misinterpreted as due to tobacco smoking, for example, "I might judge coming across someone with that sort of husky voice from overuse would be [sic] potentially just making the assumption that they're a smoker or something" (participant 3).

Workplace barriers to vocal health

Across the interviews, GFIs reported persistent "workplace barriers to vocal health."

Participants reported limited exposure to vocal education, and that the vocal education they had received while working in the fitness industry was either brief or nonexistent. Many participants attributed the prevalence of voice difficulties among GFIs to a lack of education. When GFIs stated that education or training had been received, it was often characterized as brief, uninteresting, and irrelevant to them. GFIs also reported that they had received no training on the operation of microphones or speaker systems. Some GFIs also stated that they were concerned that managerial staff may have had no education in voice use, and that this made it difficult for GFIs to advocate for improvements in this area.

Participants also spoke of reported apathetic attitudes toward voice use and voice care within the industry, stating that voice was not prioritized in industry practice. GFIs reported that management staff did not understand the importance of voice in the GFI profession, and that they were often pressured to work despite vocal problems. Participants reported inadequate or faulty amplification equipment, describing frustration with long wait times to have equipment replaced or repaired. GFIs reported in-

creased vocal strain while teaching with inadequate or faulty equipment, as well as experiences of vocal difficulty and change following use of that equipment. Furthermore, GFIs stated that it was embarrassing to implement vocal hygiene (eg, vocal warm-ups) in the workplace, with no suitable space for such practices to be performed, and that this was one reason why vocal hygiene practice was not regularly used.

Theme 2: educational preferences

Content

GFIs spoke about the content of voice education across four distinct subcategories: "Voice education content," "Equipment training content," "Treatment options for voice problems," and "Industry standardization of content."

When describing the specific information content they would prefer to be included in an education and training program, GFIs commonly requested education and training relating to preventative voice care, such as vocal hygiene and voice techniques, for example, "How do I do that? So, how to prepare my voice and that sort of stuff" (participant 8). Education on how to use the voice safely was another recurring preference among participants. GFIs requested training regarding safe vocal projection, as well as education on what constituted vocally abusive behaviors, for example, "All group fitness instructors should learn more about how to effectively use their voice without overusing it" (participant 7).

GFIs also reported preferences regarding the style of education provided. Some participants stated that they would prefer detailed information, and that information based on examples

of persons who had experienced voice disorders would be more engaging, for example, “You know, to hear about those people that may have gone through that [voice disorders] and are still impacted by that . . . I guess I like being about [sic] to see that sort of information” (participant 5).

Information about the anatomy and physiology of voice production was reported by GFIs as potentially helpful, and some participants requested that education involve information about how to identify symptoms of vocal damage. It was also suggested that this information be delivered to managers, as well as GFIs, to promote shared understanding of vocal demands and risks to vocal health in the workplace, for example, “I think there’s still an issue sometimes between managers of the gym and instructors . . . they [managers] need an education on what the job requires of our voices to make them understand the risk we’re taking” (participant 1).

Beyond voice use, participants reported that it was important to include education on amplification equipment used in the workplace. Most prominently, they requested education and training in the use of microphones and speaker systems as well as how to troubleshoot faulty equipment.

Several participants also requested that education content include information about treatment for voice problems. Specifically, GFIs reported that it would be valuable to receive information about which health-care professionals they should report voice difficulties and changes to, as well as what treatment pathways may be available to them. Some GFIs requested that education content be standardized in either certification or industry training processes within the profession. This was suggested to address what participants reported as low levels of voice education among GFIs, as well as a culture of disregarding voice education and voice difficulties within the industry.

Delivery

The three subcategories generated relating to education delivery were “Internet-based delivery,” “App-based delivery,” and “In-person delivery.” Across these subcategories were the attitudes of GFIs relating to each mode of delivery, the perceived benefits of that mode of delivery, and the content that should be delivered by each mode. Participants reported all modes were desirable.

GFIs spoke positively of web-based education delivery (eg, via websites and email) with both text-based and video components. Participants reported that the benefits of electronic, web-based delivery were convenience, ease of access, and easy re-access. Multiple participants also reported that digital, app-based content delivery was desirable in the delivery of voice education, with some stating that app-based voice training as well as examples of, and reminders for, vocal hygiene would be beneficial.

In-person delivery was reported as preferable by some GFIs for delivery of initial voice education, direct training of skills such as projection, and instances where voice problems were persistent or of particular concern. Participants suggested that repeated in-person skills training in vocal hygiene and voice use would be useful in the maintenance of vocal technique. One GFI stated that this should occur quarterly, in line with standard

industry-based professional development. Some GFIs also reported that information presented in-person was more likely to be effective and engaging.

DISCUSSION

GFIs have complex and nuanced experiences of voice use and vocal health. Since entering the industry, GFIs reported recurrent experiences of aphonia, throat pain, pitch changes, and vocal hoarseness. These findings align with previous research,^{2-5,8} and highlight that voice difficulty and disorder continues to be an issue within the fitness industry that is deserving of attention. Furthermore, GFIs expressed ongoing concern about their vocal health and the impact it had on their ability to function within and beyond the workplace. Despite these concerns, GFIs stated that vocal health remains poorly managed and of low priority within the industry, with GFIs receiving suboptimal support for their voice difficulties.

GFIs cited inadequate amplification equipment and education associated with its use as a core barrier to voice care and vocal health. Rumbach⁴ previously established that the vocal volume used by GFIs during instruction activities had no relationship with whether they used a microphone, and Rumbach et al¹⁹ noted that, even though voice amplification is acknowledged as a means to reduce vocal loading and associated voice problems, GFIs develop voice problems despite consistent microphone use. This may suggest that, even if GFIs were able to reliably access functional amplification equipment in the workplace, their use of amplification equipment may be suboptimal, and further education may be required to address this. Lack of amplification may also be addressed by providing education around safe voice use in large spaces, or on room acoustics, environmental noise, and other factors that may act as barriers to voice use.

This study also revealed that GFIs often engaged in spontaneous behavioral adaptations in response to their ongoing voice problems. However, no GFIs reported using adaptations or techniques that they had learned from voice education and training. This suggests that, although GFIs have awareness into their voice difficulties, either (1) they lacked education as to how to appropriately address voice difficulties or (2) the education they had received may have been inadequate, did not appropriately address their needs, or had been forgotten. Considering this, GFI-centric voice intervention within this population may be a valuable method of capitalizing on the displayed motivation among GFIs to respond to their voice problems and ensure that their actions are effective and evidence based. It may also reduce their reliance on potentially ineffective methods of self-care, which, although perhaps not directly harmful, could discourage them from seeking more effective intervention by providing a false sense of care.

An interesting finding of the study was that some GFIs stated that they believed that instructors’ poor vocal quality may impair the ability of the exercise participants to enjoy a class and understand information given by instructors. Rogerson and Dodd²⁰ found that children listening to teachers with dysphonic voices had greater difficulty in processing the spoken information given to them, regardless of gender, intelligence quotient, geographic

location, or socioeconomic status. If a similar effect was observed when exercise participants are being led by GFIs with disordered voices, it may place exercise participants at increased risk of injury. Although this has not yet been explored in exercise class participants, the information that GFIs are required to verbally communicate in classes is fundamental to exercise participants' engagement and safety.¹⁵ Although GFIs may be able to provide some instruction to class participants using visual cues, not all cue types can effectively be delivered nonverbally.¹⁵ The type of exercise being performed can also obstruct the participant's view of the GFI (eg, in yoga, the *drishti* or focus point in *adho mukha śvānāsana*, commonly known as downward-facing dog, is in between the toes). Further research that explores the link between disordered voices and information processing may further serve to prompt support from industry leaders in the implementation of standardized voice education within the industry.

Rumbach⁵ has previously emphasized the need for occupational voice disorder prevention to explicitly involve industry leaders, managerial staff, GFIs, and the health-care professionals involved in the care of GFIs. A similar approach was also recommended by GFIs in this study, who stated it was necessary to promote understanding of, and to reduce apathetic attitudes toward, voice problems within the industry. Previous literature has identified significant differences in perception of importance of voice problems among fitness industry staff, and the need to promote shared knowledge and responsibilities in the workplace.^{21,22} An education program delivered to a broader audience of fitness industry staff may help to unify attitudes and action, and improve the experiences of GFIs.

The clear desire of GFIs for industry voice education should encourage speech-language pathologists, health professionals, and occupational stakeholders to advocate for the provision of standardized, mandatory education and training services that address the needs of the population. GFIs in this study communicated clear preferences for the content of voice education and training. Specifically, they consistently reported that preventative voice care and training in safe voice use should be included. Studies in other occupational voice user populations have shown that similar voice education packages have been successful in both reducing and preventing voice disorder and difficulty.^{9–12} Chan⁹ showed improvement in vocal functioning of teachers following education on vocal abuse and training workshops on vocal hygiene. Bovo et al¹⁰ found that educational lectures, voice training exercises, and vocal hygiene had positive benefits in reducing voice dysfunction in teachers. Pasa et al¹¹ demonstrated positive vocal improvements in teachers following the implementation of vocal hygiene education and vocal function exercises. Nanjundeswaran et al¹² found that vocal hygiene may be sufficient to prevent voice disorders in vocally healthy student teachers and, when combined with voice training, can have positive outcomes in teachers experiencing voice problems. Considering these documented successes and the data from the current study, there is clear potential for the development and implementation of a voice education and training program that focuses on preventative voice care and training. This suggests that the implementation of preventative voice care

by clinicians treating GFIs is not only appropriate but is also, as per the findings of this study, desired by GFIs.

Regarding the delivery of such content, this study found that GFIs do not prefer one mode of content delivery over another. Rather, GFIs would prefer delivery of voice education to be multimodal, with modes of delivery (such as face-to-face didactic teaching, text-based education, video-based instruction, and app-based education and instruction) selected specifically for the type of content being delivered. Multimodal education has been shown to be preferable in the delivery of health education and necessary to support the broad range of learning preferences among individuals.^{23,24} Access to education through engagement with physical and digital tools may also benefit health education outcomes,²⁵ and multimodal approaches to health education have been shown to promote desired behavioral changes.²⁶ This, when considered with the preferences of GFIs in this study, supports the idea that a multimodal approach to voice education would be both an appropriate and a recommended strategy for content delivery. Although financial and time restrictions may inhibit lone clinicians from designing and implementing multimodal training programs with all GFI clients, speech-language pathologists should seek to ensure that intervention is multimodal when possible (ie, incorporates visual aids, video content, and digital reminders or props to support face-to-face intervention delivery) to facilitate the transition of knowledge and skill from the therapy room to occupational and exercise-related communicative contexts.

GFIs reported that education and training of vocal skills, such as projection and vocal hygiene techniques, should preferably be delivered in person. Some GFIs stated that in-person delivery would need to be provided repeatedly to ensure GFIs were able to maintain practical skills being taught, and it was suggested that quarterly access would be an appropriate frequency of delivery. This request for repeated exposure to maintain proficiency is supported by the findings of Pizolato et al,²⁷ which suggested that re-exposure to voice intervention every 3 months was required to sustain intervention benefits. Review of a major group fitness provider website²⁸ illustrates that industry training workshops are hosted for GFIs quarterly across multiple major Australian cities.²⁸ This, alongside the findings by Pizolato et al,²⁷ matches the frequency suggested by GFIs. It also suggests the potential for implementation of standardized programs as part of industry-run GFI training workshops that provide both introductory and ongoing voice education. Professionals seeking to deliver such programs should seek to integrate their training within industry-based education and training.

For digital delivery of content, ease of access and re-access of content through internet and app-based modes made these forms of delivery desirable to GFIs. Apps were favored particularly among interviewed GFIs as a method to provide prompts and guides for vocal hygiene. Apps have been reported to be helpful, enjoyable, and effective methods in increasing desirable health behaviors through education in select populations.^{29–32} There is currently ongoing research into the use of apps in health education with target populations,³³ and mobile devices have been recognized as offering great potential for increased and novel delivery of health education.^{34,35} GFI preferences for app-based

information therefore should be approached with the knowledge that success in other populations could be replicated, and that this is likely an appropriate avenue of GFI health education delivery. Clinicians are therefore encouraged to use apps that may be useful in the delivery of voice education (eg, vocal hygiene instruction or reminder apps), as well as support the development of apps that may address current gaps in education content.

These data, when considered as a whole, provide professionals with clear directives for the content and delivery of education to meet the preferences of GFIs. The data presented are important to consider when designing intervention tailored to this population. It can be used to allow health professionals to understand why GFIs have certain preferences for intervention, what those preferences are, and how to implement intervention in line with those preferences to address the needs of the population. It provides a consumer-driven bank of information to ensure that future approaches of intervention are consumer led, allowing future services to be designed in response to the experiences of health-care consumers, and highlight factors and concerns within the population that may benefit from further research attention.

Limitations and future directions

This study represents the first description of a framework for a voice education and training program designed to cater to the needs of GFIs. The results of this study allow for future practice to function in direct response to the attitudes and preferences of GFIs, and therefore be more responsive to the needs of the group fitness industry as determined by GFIs themselves. Although the eight participants came from across Australia and presented with varied demographics, it cannot be confidently stated that the attitudes and preferences reported by participants in this study represent those of all GFIs in Australia. However, as the reports made by GFIs in this study aligned regarding the content and delivery of voice education, it is likely that data saturation was reached or was close to being reached after these eight interviews. Researchers and clinicians should engage GFIs in the development and evaluation phases of any tailor-made voice education and training programs.

Although the self-selection sampling that was employed in this study can be viewed as a potential source of bias, this meth-

odology allowed an improved likelihood of collecting responses that reflected the desires of GFIs with interest in such a program. However, in this study, there was equal representation of GFIs who reported experiencing voice problems and those who did not. There was no pattern of discrepancy found between the preferences of these participants.

Many of the preferences of GFIs described within the study are supported by current research evidence on voice education and training, as well as on the delivery of health education in other occupational voice sectors. Clinicians who plan to deliver intervention to this population should ensure that any intervention is implemented with consideration of these preferences.

Further research is required to determine the effectiveness of the described preferences for content focal points and delivery methods in reducing voice difficulty and disorder among GFIs. It is also recommended that future research in this population include measurement of the voice changes of GFIs over time, to better determine the long-term impacts on voice experienced by individuals in the group fitness industry as compared with age-related voice changes. Finally, the potential impact of dysphonic voice quality on the language processing of group fitness class participants is another future avenue of investigation. It is important for industry leaders to understand whether voice difficulties may undermine the transfer of verbal information in classes, and potentially lead to increased risk of harm for their customers. A clear understanding of any potential risk may inform the implementation of future voice education and training in the group fitness industry.

CONCLUSION

This study aimed to explore GFIs' experiences of occupational voice use and their preferences for the content and delivery of voice education and training. The information presented here should be considered when developing, implementing, and evaluating a voice education and training program tailored to the needs of GFIs.

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APPENDIX 1. TOPIC GUIDE

Question Number	Question	Prompts
1	Tell me about your voice.	a. Describe any difficulties you have had with your voice. b. How did difficulties affect you and your ability to communicate in everyday situations? c. How did this affect your ability to communicate in the workplace? d. Tell me what you think contributed to these problems. e. How did you address these problems? f. Can you tell me how successful this approach was? g. What did you think contributed to that success or lack of success? h. Do you think voice problems have any implications on how you are able to perform in the workplace? i. Do you think voice problems have any implication on how people view your health?
2	Tell me about any voice education that you have had.	If you <i>have had no exposure</i> to voice education: a. Why do you think you have not had any voice education? b. What are your thoughts on voice education—do you think voice education for this industry would be a valuable resource? If you <i>have had exposure</i> to voice education: c. Tell me about the voice education you have had. d. What did you think of the program(s)? e. Tell me things that you thought were particularly good, effective, or helpful within the program(s). f. What were some things that you would have changed about the program(s)?
3	If we were to design a voice education program tailored to you, tell me about what type of information you would like us to include.	a. Tell me about the sort of information you would like to receive.
4	How would it be easiest for you to receive and access this information?	a. Tell me specifically what kinds of ways you would like to access education materials. b. Why would you like to access the information this way?

APPENDIX 2. GFI PREINTERVIEW QUESTIONNAIRE

1. Please state your age: _____
2. Gender: _____
3. In which state or territory do you live? _____
4. Is group fitness instruction your primary occupation? Yes OR No
If no, what is your primary occupation? _____
5. Please list all of the group fitness programs you are currently teaching:

6. How many years have you been working as a group fitness instructor? _____
7. What is the average number of days you instruct per week? _____
8. What is the average number of classes you instruct per week? _____
9. What is the average number of classes you instruct per day? _____
10. Do you teach more than one class consecutively? Yes OR No
If yes, how often and how many classes do you teach consecutively? _____
11. Have you experienced any problems with your voice since entering the fitness industry? Yes OR No

APPENDIX 3. AN EXAMPLE OF THE QUALITATIVE CONTENT ANALYSIS MATRIX

Meaning Unit (MU)	Condensed MU	Code	Subcategory	Category	Theme
"Otherwise I'd try like to rest my voice during the day and then I was just talking during the class."	I'd try to rest my voice during the day and only talk during class.	Compensatory vocal rest	Behavioral adaptations to voice difficulties	Voice use at work	GFI experiences of occupational voice
"I always feel like I've - I have just overused my voice."	I feel like I have overused my voice.	Perception of vocal fatigue	GFI experiences of voice		
"And I think that gets a miss in all their training. Completely missed."	I think that's completely missed in training.	Lack of voice education in training	Training limitations impacting voice	Workplace barriers to vocal health	
"It's just a really crap setup. Like, the speakers are crap, they're unreliable, the microphone's crap."	The speakers are unreliable, the microphone's crap.	Inadequate projection equipment	Equipment barriers		
"Well, I s'pose um sort of looking at the preventative measures. So, what should we be putting in place as instructors um to prevent the loss of our voice."	Preventative measures. What we should be putting in place to prevent voice loss.	Preventative measures to protect against voice loss	Voice education content	Education content preferences	Education preferences
"Have the gyms maybe run a session on how to use the mics properly?"	Have the gyms run a session on proper microphone use.	Desired microphone use education	Equipment training content		
"So, if you notice that your voice has changed, what do I do? Where do I go? How do I try and fix this?"	If your voice has changed, what do I do? Where do I go? How do I fix this?	Education on available response pathways	Treatment options for voice problems		
"I think it should be part of what everyone is given whenever they start working at a gym."	I think it should be a part of what is given when people start working at a gym.	Education should be standardized across gyms.	Industry standardization of content		
"I think it's important to have human contact, and just having somebody to interact with. I think we learn better that way."	I think it's important to have human contact and interaction, we learn better that way.	Face-to-face delivery leads to better outcomes.	In-person delivery	Education delivery preferences	
"But, if it's something that you could do a tutorial online with, then that makes a lot of sense to me 'cause that's easily accessible."	If it's something you could do an online tutorial with, that makes sense because it's accessible.	Online tutorials preferred owing to easy access	Internet-based delivery		
"If it was instructing you to do some warm-ups or something and you could do it while listening in the car, something like that, that would be really awesome to have on your phone."	It would be awesome to have on your phone, instructing you to do warm-ups while you're listening in the car.	App-based instruction of vocal hygiene is desirable.	App-based delivery		

Abbreviations: GFI, group fitness instructor; MU, meaning unit.

REFERENCES

1. Fontan L, Fraval M, Michon A, et al. Vocal problems in sports and fitness instructors: a study of prevalence, risk factors, and need for prevention in France. *J Voice*. 2017;31:261, e33-e38.
2. Long J, Williford HN, Olson MS, et al. Voice problems and risk factors among aerobics instructors. *J Voice*. 1998;12:197-207.
3. Newman C, Kersner M. Voice problems of aerobics instructors: implications for preventative training. *Logoped Phoniatr Vocol*. 1998;23:177-180.
4. Rumbach AF. Vocal problems of group fitness instructors: prevalence of self-reported sensory and auditory-perceptual voice symptoms and the need for preventative education and training. *J Voice*. 2013;27:524, e11. doi:10.1016/j.jvoice.2013.01.016.
5. Rumbach AF. Voice problems of group fitness instructors: diagnosis, treatment, perceived and experienced attitudes and expectations of the industry. *J Voice*. 2013;27:7786, e1. doi:10.1016/j.jvoice.2013.03.012.
6. Sapir S, Atias J, Shahar A. Symptoms of vocal attrition in women army instructors and new recruits: results from a survey. *Laryngoscope*. 1990;100:991-994.
7. Sapir S, Keider A, Mathers-Schmidt B. Vocal attrition in teachers: survey findings. *Eur J Disord Commun*. 1993;28:177-185.
8. Heidel SE, Torgerson JK. Vocal problems among aerobic instructors and aerobic participants. *J Commun Disord*. 1993;26:179-191.
9. Chan RWK. Does the voice improve with vocal hygiene education? A study of some instrumental voice measures in a group of kindergarten teachers. *J Voice*. 1994;8:279-291.
10. Bovo R, Galceran M, Petruccelli J, et al. Vocal problems among teachers: evaluation of a preventive voice program. *J Voice*. 2007;21:705-722.
11. Pasa G, Oates J, Dacakis G. The relative effectiveness of vocal hygiene training and vocal function exercises in preventing voice disorders in primary school teachers. *Logoped Phoniatr Vocol*. 2007;32:128-140.
12. Nanjundeswaran C, Li NYK, Chan KMK, et al. Preliminary data on prevention and treatment of voice problems in student teachers. *J Voice*. 2012;26:816, e1-e12.
13. Sandage MJ, Connor NP, Pascoe DD. Voice function differences following resting breathing vs. submaximal exercise. *J Voice*. 2013;27:572-578.
14. Dejonckere PH. Introduction: the concept of occupational voice disorders. In: Dejonckere PH, ed. *Occupational Voice: Care and Cure*. The Netherlands: Kugler Publications; 2001:vii-x.
15. Rumbach AF. Keeping the voice fit: voice education and training for the fitness industry. In: Khidr A, ed. *Voice Training Programs for Professional Speakers: Global Outcomes*. San Diego, CA: Plural Publishing; 2017:99-137.
16. Swan M. Emerging patient-driven health care models: an examination of health social networks, consumer personalized medicine and quantified self-tracking. *Int J Environ Res Public Health*. 2009;6:492-525.
17. Nambisan P. Enabling consumer-driven service innovation in health care: the role of online health information technologies (HIT). In: *Information Technology and Product Development*. 2010:159-177.
18. Graneheim U, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today*. 2004;24:105-112.
19. Rumbach A, Khan A, Brown M, et al. Voice problems in the fitness industry: factors associated with chronic hoarseness. *Int J Speech Lang Pathol*. 2015;17:441-450. doi:10.3109/17549507.2014.987820.
20. Rogerson J, Dodd B. Is there an effect of dysphonic teachers' voices on children's processing of spoken language? *J Voice*. 2005;19:47-60. doi:10.1016/j.jvoice.2004.02.007.
21. Williams N, Sobti A, Aw T. Comparison of perceived occupational health needs among managers, employee representatives and occupational physicians. *Occup Med*. 1994;44:205-208. doi:10.1093/occmed/44.4.205.
22. Williams N, Carding P. *Occupational Voice Loss*. Boca Raton, FL: Taylor & Francis Group; 2005.
23. Meehan-Andrews TA. Teaching mode efficiency and learning preferences of first year nursing students. *Nurse Educ Today*. 2009;29:24-32. doi:10.1016/j.nedt.2008.06.007.
24. Prithishkumar IJ, Michael SA. Understanding your student: using the VARK model. *J Postgrad Med*. 2014;60:183-186. doi:10.4103/0022-3859.132337.
25. Ioannou A, Vasiliou C, Zaphiris P, et al. Creative multimodal learning environments and blended interaction for problem-based activity in HCI education. *TechTrends*. 2015;59:47-56. doi:10.1007/s11528-015-0839-9.
26. Najafi Ghezjelz T, Abbasnejad Z, Rafii F, et al. Effect of a multimodal training program and traditional lecture method on nurses' hand hygiene knowledge, belief, and practice: a brief report. *Am J Infect Control*. 2015;43:762-764. doi:10.1016/j.ajic.2015.09.018.
27. Pizolato R, Rehder M, De Castro Meneghim M, et al. Impact on quality of life in teachers after educational actions for prevention of voice disorders: a longitudinal study. *Health Qual Life Outcomes*. 2013;11:28.
28. Les Mills Asia Pacific. Quarterly workshop schedule. 2016. Available at: <http://www.lesmills.com.au/workshops/>.
29. Mitchell GL, Farrow C, Haycraft E. An 'app'ropriate resource? Using mobile apps to provide feeding advice and support to parents. *Appetite*. 2013;71:482. doi:10.1016/j.appet.2013.06.047.
30. Phillips K, Epstein D, Mezghanni M, et al. Smartphone delivery of mobile HIV risk reduction education. *AIDS Res Treat*. 2013;2013:231956. doi:10.1155/2013/231956.
31. Garibay V, Fernández G, Torre-Díez M, et al. Utility of a health app for self-management and education of cardiac diseases in Spanish urban and rural areas. *J Med Syst*. 2016;40:1-8. doi:10.1007/s10916-016-0531-4.
32. Brayboy LM, Mezoian T, Sepolen A, et al. Girl talk: a smartphone application to teach sexual health education to adolescent girls. *J Pediatr Adolesc Gynecol*. 2016;29:161. doi:10.1016/j.jpog.2016.01.008.
33. Eysenbach G, Davis S, Merchán-Baeza J, et al. Clinical effect size of an educational intervention in the home and compliance with mobile phone-based reminders for people who suffer from stroke: protocol of a randomized controlled trial. *JMIR Res Protoc*. 2016;4:e33. doi:10.2196/resprot.4034.
34. Kratzke C, Cox C. Smartphone technology and apps: rapidly changing health promotion. *Int Electron J Health Educ*. 2012;15:72-82. Available at: <http://js.sagamorepub.com/gjhep>.
35. Bernhardt JM, Chaney JD, Chaney BH, et al. New media for health education. *Health Educ Behav*. 2013;40:129-132. doi:10.1177/1090198113483140.