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How older adults relate to their own voices: a qualitative study of subjective experiences of the aging voice

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ABSTRACT

Aim: The aim of this study was to investigate how otherwise healthy older adults with self-assessed voice problems relate to their voice and voice changes.

Method: Focus groups were conducted at an activity center to identify how older adults reflect on their own voice and the aging voice in general. The interviews were audio recorded and transcribed. The analysis was done using thematic content analysis.

Results: The analysis resulted in three main themes: "communicational aspects of the aging voice," "consequences of deteriorating vocal and communicative capacity," and "attitudes, strategies, and ideas". The participants considered voice to be an important communication tool and presented what could be interpreted as awareness regarding their voice. Voice changes were considered a natural part of aging. This attitude was also an important reason why the participants had not sought medical care for their voice problems.

The participants discussed ideas concerning extended voice use to maintain a functioning voice when aging. Simultaneously, voice changes due to aging were considered to have a negative effect on communication and social participation.

Conclusions: The voice is important for older adults, and an insufficient voice can affect communication and social participation. Information about aging voice and voice exercises, for example from speech language pathologists, could be of interest among older adults. Further studies on the voice of older adults are needed regarding how they experience their voice and the general aspects of a healthy aging voice.

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Introduction

Life expectancy has increased globally. Even among older adults, age-specific mortality has decreased [1]. People work longer and are more active in their daily life. Even in later life, this increases the need for well-functioning communication. Communication is key to a good quality of life, and a functioning voice is a prerequisite for verbal communication. In this study, we define "voice" as the signal that carries speech and language, unrelated to the use of language or dialects. Voice problems are a fairly common issue in the general adult population, with a prevalence of 16.9%, but are much more prevalent among older than younger adults (14.7% vs 2.2%, respectively) [2]. Similarly, Roy et al. [3] reported a prevalence of voice disorders of 29.1% among the older population in a number of US states. According to a recent cross-sectional study conducted in Hong Kong, the prevalence of voice problems among non-treatment-seeking adults aged >65 years is 27.7% [4]. Voice problems are most prevalent among women in the general population [2], depending partly on the daily vocal load [5] and partly on anatomical differences between the sexes [6]. However, in the age group over 65 years, there are no apparent gender differences with regard to voice problems [2]. Other aspects affecting communication are hearing (see Ref. [7]) and neurological conditions, because they are also affected by aging. However, research concerning the specific connection between voice and hearing is scarce. Neurological conditions may also affect the voice [8], for instance Parkinson's disease, with increasing risk with increasing age [9].

Typical biological aging affects the voice in several ways. Anatomically, the larynx and its muscles, cartilages, and bones change as aging proceeds. Ossification of cartilage, muscle atrophy, and deterioration of muscle control affect vocal functioning [6,10,11], often resulting in a glottal gap. In addition, deteriorating respiratory functioning impairs vocalization [10]. As a result, the acoustic properties and perception of the voice changes. Common traits in the voice of older adults are breathiness, instability and vocal fatigue

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[12,13]. A higher risk of anxiety and depression with age also has an effect on the perception of voice quality [12].

Vocal dose generally decreases with age and retirement [14]. There is some evidence that vocal activity may reduce age-related voice problems. Singing could have a positive effect on the aging voice [15], especially if done frequently [16]. There is a hypothesis that increased vocal dose, i.e. increased voice use, in general could have a positive effect on the aging voice [14]. The hypothesis is clinically based, and research on the effects of increased vocal activity is scarce. Meanwhile, older women use their voice more than do older men [14]. Many factors affect the voice, including individual factors such as gender and coping strategies and environmental factors such as air pollution and ambient room acoustics. These factors are widely explored within the field of voice ergonomic research [17], but older adults have not been specifically accounted for in the studies. Research on the voice of older adults often focuses on diagnosed patients with dysphonia and/or presbyphonia [11,14,18,19]. Few studies have investigated how older adults without diagnosed voice disorders perceive their voice and voice use in relation to participation and communication. Therefore, it is of interest to further explore how undiagnosed older adults perceive their voice and the way it may affect their communication and interaction.

The aim of this study was to describe and analyze how older adults (aged >65 years) experience voice and communicational aspects of aging. The core research question was: How do older adults relate to their own voices?

Materials and methods

The present study used a qualitative method with an inductive approach. The data were collected using semi-structured focus group interviews. The analyses were made with thematic content analysis manually and coded with NVivo12 software (producer QSR International, 2018). Demographic information was further collected with one questionnaire concerning medications and another regarding vocal health.

All authors are speech language pathologists specialized in voice, except author number four, who is a phoniatrician and laryngologist. All the authors have experience in voice research and clinical work with voice patients. The first author has worked especially with older patients with voice problems, acquired language disorders, and dysphagia. This work is part of the first author's PhD project. She also works as a singer and has been a choirmaster.

Participants

The participants were recruited at an activity center for older adults in western Sweden and were thus strategically selected. Individuals over 65 years of age were asked to participate; those who were interested were handed an information sheet listing the inclusion criteria, subjectively validating their eligibility to participate. Participants had to meet the following criteria: having a subjective experience of voice problems; not having sought medical treatment for voice problems; not having any underlying neurological diagnoses (affecting the voice, speech, and communication); not having suffered any brain injury (stroke, traumatic brain injury); having normal hearing or corrected hearing using a hearing aid, and speaking Swedish as their native language. The statement on subjective experience of voice problems was rated by a question previously validated and included in the Stockholm Public Health Cohort Study, "Does your voice tire, strain or get hoarse when you talk? Disregard symptoms that depend on current cold or upper-airway infection. The voice symptoms may vary but try to estimate an average" [2].

After recruitment, individuals filled in a questionnaire regarding vocal health and medical factors known to have a possible negative effect on voice health. This included medications (such as corticosteroids, e.g. asthma spray and allergy medications) and common diagnoses/diseases (such as chronic obstructive pulmonary disease and gastric reflux).

Participants eligible for the study filled in a Voice Handicap Index (VHI): VHI-Lund-11, a Swedish validated questionnaire [20] based on the VHI-10 [21]. The purpose of presenting the participants with the questionnaire was to use it as a starting point for the focus group discussions and as vocabulary for the participants.

Demographic information

Fourteen individuals participated in the study. Participants were aged between 67 and 83 years, and comprised thirteen women and one man. Ten participants did not have any diseases or use any medications that could have affected their voice. Four participants had diseases or used medication, two of them having a combination of two or more. Diseases or medications named were chronic lung disease, use of asthma spray (corticosteroids), periodic gastric reflux, frequent respiratory infections, allergy affecting the respiratory tract, and allergy medications. Four participants had earlier had a voice-intensive profession, none of whom had any diseases/medications that might have affected their voice.

Additionally, none of the participants were active smokers. However, seven participants had quit smoking 1.5–40 years ago.

Focus group interviews, procedure, and analysis

The interviews were semi-structured, and participants were allocated to one of three focus groups at their convenience. Author number three served as moderator during the interviews. An interview guide was used and included an opening question, introduction to the topic, and questions on subjective/perceptual symptoms, quality of life, and working life/previous voice health. Each focus group had four or five participants. According to Malterud [22], it encourages discussion if the number of participants is neither too small nor too large. The interviews were audio recorded and transcribed in 2016 by author number three with minor adjustments to the final transcript. Each interview was transcribed

verbatim to reproduce as closely as possible what the participant was trying to convey, including emotional expressions of importance for the interpretation [22]. Author number three also performed the preliminary coding and analyzed the material. To achieve a more experienced and multifaceted analysis, author number one completely recoded and reanalyzed the material in the spring of 2020. The thematic content analysis was conducted according to Malterud [22] using an inductive approach. First, a reading of the material highlighted a couple of preliminary themes. Next, meaning units were extracted from the original transcript and coded manually into the preliminary themes, whilst parts not considered to adhere to the topic were left uncoded. During the coding process some new themes and thoughts concerning subgroups (i.e. subordinate themes) emerged. At this point, further coding was done with NVivo12, since this software gives an overview of the data [23]. NVivo12 facilitates the organization, categorization, and analysis of the data. The original transcripts were uploaded to NVivo12. Analysis with NVivo12 was based on the themes previously coded manually, but subgroups (in NVivo12 called "child-nodes") were also extracted by the program. Meaning units were also partly recoded. The material was reviewed by the coauthors several times. Finally, three main themes emerged during writing up of the results. The data were analyzed with an inductive approach. The themes were identified without predestined categorization.

The Swedish Ethical Review Authority approved this study in 2020 (Registration No. 2020-01678).

Results

The focus group interviews were conducted in Swedish. All quotations in the article were translated by a native English speaker and were reviewed for accuracy by the authors of the manuscript.

Clusters, themes, and subgroups

All fourteen participants participated roughly equally in the semi-structured interviews. Based on the analysis, three main themes emerged: "communicational aspects of the aging voice," "consequences of deteriorating vocal and communicative capacity," and "attitudes, strategies, and ideas". These main themes are further divided into seven: "communication," "factors," "voice use," "voice changes as a result of aging and retirement," "consequences," "attitudes," and "strategies." Some themes where further coded into subgroups. Examples of each main theme, theme, and subgroup are given in Table 1.

Communicational aspects of the aging voice

Communication. The theme "communication" included circumstances interfering with the voice and communication paths, both for the speaker and the communication partner/receiver. Hearing and hearing impairment as communication barriers were discussed as factors affecting the way of speaking.

> I have to speak very loud as my old man is deaf in one ear. So I have to raise my voice a lot.

Hearing impairment was also suggested as affecting the communication environment when it means raised voices:

> Don't you think it's because you get older and have a little more difficulty hearing? So the noise level rises.
>
> If your hearing gets worse, you raise your voice.

Participants also discussed communicative aspects as a communication partner. Although they used other communication tools than their voice, such as text messages and emails, in their experience the voice was an important communication channel.

> The voice is very revealing. I prefer to ring rather than text, because then I can hear straightaway. With my children, for

Table 1. Description of thematic content analysis with examples of meaning units, condensed into code groups and subordinated subgroups, finally resulting in a main theme.

Meaning unit	Theme	Subgroup	Main theme
"*When your hearing is poor you speak louder yourself.*"	Communication	–	Communicational aspects of the aging voice
"Yes, being upset must affect the voice, making it quieter. You don't speak out, but *rather* keep your voice down."	Factors	Individual factors	Communicational aspects of the aging voice
"It's like that in the morning too, before your voice has got going."	Factors	Environmental factors	Communicational aspects of the aging voice
"*I talk to myself as I have nobody else to talk to.*"	Voice use	Current voice use	Communicational aspects of the aging voice
"*I think it's because when you went to work you used to start quite early in the morning.*"	Voice use	Earlier voice use	Communicational aspects of the aging voice
"*So I notice, that I can't sing any more, not soprano anyway.*"	Voice changes as a result of aging and retirement	–	Communicational aspects of the aging voice
"*And I think, you know, I'd really like to ask that. But I'm very hoarse now, I can't. They won't hear me anyway, so I leave it.*"	Consequences	–	Consequences of deteriorating vocal and communicative capacity
"*I suppose you just have to accept that your voice isn't so easy to hear anymore.*"	Attitudes	–	Attitudes, strategies, and ideas
"*But I practice at home and do a proper warm-up when I get to choir practice and so on. That helps.*"	Strategies	Implemented strategies and measures	Attitudes, strategies, and ideas
"*Maybe I should go around talking to myself. I get very hoarse.*"	Strategies	Proposed strategies and measures	Attitudes, strategies, and ideas

> example, especially my daughter, I can tell if anything's up. What's happened? But we were supposed to be talking about older people, weren't we?

Factors. Participants mentioned both individual and environmental factors regarded as affecting the voice. These factors were divided into two subgroups:

Individual factors. One "individual factor" was "*breathing*," which some participants referred to as "*lung capacity*". In the participants' experience, lung capacity and breathing deteriorated with age and affected their voice. Impaired breathing was also discussed as a cause of tiredness. Health-related behaviors such as smoking were considered to affect breathing and result in coughing. Age in itself, as well as illness, were judged to affect the voice as well.

> You notice as soon as you're not well, you notice that your voice changes.

Other individual factors such as general mood, feelings, and psychological health were discussed as factors impacting the voice.

> Yes, being upset must affect the voice, making it quieter. You don't speak out, but rather keep your voice down.

Physical health and medications were also commented on. One of the participants had gone through anti-hormonal therapy after breast cancer and had experienced a very dry mouth as a side effect of the therapy. At the same time, other participants without the same medical history also experienced a dry mouth. A dry mouth was judged to affect vocalization.

Nervousness, snoring, and colds were other individual factors suggested as affecting the voice, although not further discussed.

Environmental factors. Factors in the participants' environment judged to affect the voice were labeled "environmental factors." A recurrently mentioned environmental factor negatively affecting the voice was the time of day, especially mornings. Participants explained it as being more difficult to vocalize in the morning and mentioned the absence of vocalizing at night as a possible explanation.

> It's like that in the morning too, before your voice is warmed up and so on.

Not everyone agreed, and one participant in group three felt the opposite.

> And I would say not. And I love talking in the morning. [Laughter]

Time of year affected the voice too, according to several participants.

> Yes, the summer's better. In the summer everything's all right. My back isn't stiff or anything. Everything is better in the summer. Well, it softens you up.

Smoking was discussed as a social environmental factor. Cigarette smoke was judged to affect the environment through passive smoking.

> And then in our generation, those who didn't smoke were affected by smoke, as everybody smoked everywhere. You used to sit in smoky places.

This quote also implies a difference between generations.

Other environmental factors mentioned, but not further discussed, were pollution, pollen, and dry air.

Voice use.

> "Voice use" was signified by information about how participants used their voice in contemporary daily life, as well as previously in their working life and spare time. "Voice use" was therefore divided in two subgroups, "Current voice use" and "Previous voice use."

Current voice use. "Current voice use" consisted of utterances regarding voice use in participants' everyday lives as pensioners. However, one participant still sometimes worked part-time, even though now a pensioner. Participants currently used their voice on the telephone, when talking to their spouse, talking to their children and grandchildren, singing in a choir, and in clubs and associations. However, despite being relatively active senior citizens, many expressed solitude. Solitude reduced their perceived amount of voice use and many participants mentioned talking to themselves.

> I talk to myself, because there's nobody else to talk to.

However, most participants were very active, which also affected their vocal patterns:

> But now that I'm older, talking to myself and so on. But I get out and about a lot. I don't sit at home at the kitchen table, I can talk all right.

One participant also sang to herself at home while listening to music programs.

Earlier voice use. The theme "previous voice use" consists mostly of descriptions of vocal communication in previous working life. However, not everyone considered that they had had a voice-intensive profession. Working life included daily routines other than current habits.

> I think it's because when you went to work, you used to start quite early in the morning.

Some participants also connected personality and voice use in early childhood to their previous and current voice use. One participant said that her voice had always been weak, and another said she had always been shy and not so talkative.

> I have had a voice that has never been easy to hear. Like when the children were little, Nobody ever heard me. I had to ask someone else: Can you call them? Then they heard straightaway. My voice disappears. Lots of people have told me that.

Voice changes as a result of aging and retirement. This theme included thoughts and experiences of voice change, but also absence of voice changes. Some participants experienced ambivalent scenarios, where the voice varied a lot.

> The morning can be a bit like that, before you get talking so it's a bit of a pest I find, now that I'm older. But otherwise, I don't think it's too bad. I sing, you know, and that's OK. I'm actually still a soprano, even though I'll be 75 soon. Yes, it's still all right.

Discussions concerning voice changes mainly touched existing and perceived changes in the voice. Many participants thought it was easier to hear other people's voices change with age.

> You can't judge by your own voice. But looking back, at my mother for example when she got older, and when I think of others who were much older than me, then I think it gets quieter and a bit slower.

However, participants did describe their own voice as deteriorating, coarser and weaker. One participant said that changes in the voice occurred slowly over time.

> It doesn't suddenly happen overnight; it happens gradually, and you don't really think about it.

Some participants mainly experienced changes in their voice when singing.

> I can't sing properly anymore. I can hear in my head how it's supposed to sound, but when I try it, out comes something else.

> So it's noticeable that I can't sing anymore. Not soprano, anyway.

A few participants had not noted any voice changes with aging.

> It hasn't occurred to me that I might have had problems, but I perhaps haven't given it enough thought.

The singing voice was also considered unaffected for some participants.

Consequences of deteriorating vocal and communicative capacity

Consequences. Examples of voice problems and the consequences of voice aging emerged. Participants mentioned both individually perceived consequences and noted the consequences in others. A couple of participants pointed out symptoms of vocal fatigue as the main issue, and said that the voice disappeared after using it for prolonged periods and/or when high demands were put on it.

> If you've been sitting talking to people for two or three hours, then I may notice that I lose my voice a bit.

When the voice disappeared, it could be associated with feelings of frustration.

> That's right. You feel you have something important to say, and your voice just disappears. You can really feel a lot of frustration. It doesn't happen often, but when it does, it's annoying and awkward, actually.

Voice problems were judged also to affect quality of life.

> Yes of course it affects the quality of life. You have to accept that if that's how you are, that's how you are. [Laughter]

Voice deterioration affected social participation because of voice problems and impaired the ability to communicate. At least one participant in each group experienced withdrawal from social participation. Some had completely avoided a specific social event, while others participated in social events but avoided talking.

> And I think, oh I'd like to ask that. But I'm really croaky now – no there's no point, they won't hear me anyway. So I leave it.

> You could get into that situation. That you hesitate. That you're afraid your voice won't hold. It can happen sometimes that you hold back when you actually wanted to say something or other. I expect everyone has that experience.

Instead of using the voice, a couple of participants had asked their spouse to speak for them.

A couple of participants had experienced reactions to their voice from the social environment. One participant said that people did not recognize her voice, while another instead mentioned reactions to voice characteristics such as hoarseness and breathlessness.

> I often get comments. Oh! How hoarse you are! And, Why aren't you breathing properly? Lots of people point that out.

Participants experienced comments from relatives on appearing to have a cold, even when this was not the case.

An impaired voice also affected the singing voice, which was emotionally negative for some participants.

> Because it was very sad for me when I had to give up singing.

Attitudes, strategies, and ideas

Attitudes. The theme "Attitudes" involved statements regarding attitudes to voice changes and aging. The participants felt that changes in the voice were a natural part of aging, apart from one:

> I don't. I think my problems are due to my cold. I don't think of it as having to do with age.

Having a natural attitude to voice changes led to the absence of concern and anxiety.

> You probably just have to accept that your voice can't be heard so well.

The acceptance of voice problems was also a reason why participants had not sought care for them. Another reason was that they considered their voice problems to be marginal. There was less general agreement in one of the focus groups than in the other two.

> I don't notice any difference since I've got older.

One focus group also discussed articulation deteriorating with aging.

Other participants also remarked that it is difficult to hear your own voice changing.

> Other people would notice more if your voice changed.

A common opinion was that the voice is a very important communication tool, despite the person being more alone as a pensioner than in their previous working life.

> On the subject of voice, I would say that if I had to choose between going blind or deaf, I'd rather be blind. Not that I want to, but if I had to choose. I'm very sensitive to voices. I think the voice is everything.

However, the demand for a functioning voice was not considered as high as in their working life.

There was general interest and curiosity among the participants concerning how others feel and experience their voice. Therefore, many participants were happy to take part in the discussions of the focus group interviews.

> It's good to hear how others are. Then it doesn't seem so bad for me. This is really interesting. It is. You shouldn't complain too much, because it's the same for others.

Strategies. The theme "strategies" included two subgroups. The subgroup "implemented strategies and measures" meant strategies already used by the participants or others to improve the voice. The second subgroup "proposed strategies and measures" was defined as proposed strategies and measures not implemented in the participants' daily life.

Implemented strategies and measures. Coughing and throat clearing was a frequently used strategy to clear the voice and enable a person to start talking. Another strategy was to use the voice and talk a little to oneself just before speaking with others and retakes were done if the voice did not work the way it should. Some participants had obtained a humidifier to reduce the dryness of the ambient air. According to one participant, a glass of water beside the radiator sufficed. Participants also talked about strategies for moistening the mouth when it felt dry.

> Yes, you're supposed to drink, and you often get dry and then you should drink. Lots of people go around with a little spray bottle in their bag and feel this, I think.

However, another participant felt that water did not reduce the feeling of dryness.

Several participants referred to "practicing" when speaking about voice improvement, sometimes further described as vocal exercises. One participant said that "practicing" along with vocal warm-ups was the key to a successful, improved voice.

> But I practice a lot at home and do proper warm-ups when I get to the choir and so on. That helps.

Singing was suggested as a way of improving the voice.

> … but the doctor told him to join a choir and sing and that was very good, he noticed that. And he had fun, too. [Laughter]

Proposed strategies and measures. Participants had a lot of thoughts and ideas concerning strategies and measures to improve the voice. The benefit of using the voice was discussed, and participants shared thoughts on how voice use could improve their voice. Both speaking and singing were judged to improve the voice.

> Perhaps I should go around talking to myself, as I get so hoarse.

Someone had asked another participant at a choir rehearsal if she wanted a saliva stimulator, but she had declined.

One participant wondered if difficulties with the voice are common. New ideas were generated during the discussions. A speech language pathologist and vocal coaches were suggested as potential help in providing intervention:

> So really, I ought to go to a speech therapist. [Laughter]
>
> So you've never spoken to a speech pathologist about the problem?

Voice activities and training at an activity center by a speech language pathologist was also mentioned.

Discussion

This study investigated how non-treatment-seeking older participants relate to their voice. Three main themes emerged during the analysis: "communicational aspects of the aging voice," "consequences of deteriorating vocal and communicative aspects," and "attitudes, strategies, and ideas."

Participants considered their voice to be an important communication tool. They revealed great awareness concerning their voice, even though not everyone had had voice-intensive professions, nor did everyone have singing experience. Both the speaking and singing voice were considered to be affected by age in several ways, which in turn affected communication and even social participation. Voice changes led to feelings of frustration. Participants primarily considered that voice changes are a natural part of aging and they used various strategies to improve their sense of wellbeing.

Demographic information concerning subjective vocal changes

Voice problems among older adults seem to be very diverse. Self-assessed voice problems were one of the inclusion criteria in this study. No laryngeal examination or assessment was conducted, and therefore no conclusions can be drawn concerning vocal status among the participants. The scores from the VHI-Lund-11 questionnaire and demographic data collection revealed a diverse number and degree of vocal problems. Voice disorder is a symptom-based diagnosis and depends on vocal demands and experience [24]. Participants who had had a voice-intensive profession did not report any underlying diagnoses, and most of them also scored relatively low on the VHI-Lund-11.

The original VHI-Lund-11 questionnaire includes a question about economy and income [20]. This was excluded in our study, since we assumed that vocal problems would not affect the economic situation of pensioners. However, it turned out that two participants worked part-time post pension, and therefore vocal problems could hypothetically be a matter of economic concern also for this group.

Importance of increased and healthy voice use

All focus groups discussed increased voice use as a daily strategy for maintaining a good voice. Increasing vocal activity to maintain vocal capacity has also been a

hypothesis among clinicians and in studies on the voice of older adults [14]. However, the same participants experienced vocal fatigue especially after high vocal demands and extended voice use. One reason could be that it is not only the amount of voice use, but also how the voice is used that has an impact on the voice. For example, Prakup [15] showed that singing has a positive effect on how the voice ages, and that people who sing often have a better vocal technique than others do. Another study, on choral singing, showed that suboptimal vocal technique when singing in a choir can have negative effects on vocal health, with vocal fatigue as a consequence [25].

Some participants in the present study discussed hearing impairment as a reason for raising their voice, since it is more difficult to hear onés own voice. An environment with raised voices leads to increased ambient/background noise and, according to the Lombard effect [26], thus leads to increased vocal demands. It is possible to improve the speech environment with reduced background noise and vocal hygiene advice [17,27]. This is of particular importance for workers in voice-intensive professions [28,29]. However, vocal hygiene and advice may be as important for pensioners as it is for younger, working individuals. In the context of older adults, vocal hygiene advice could focus on the quality of life, social participation, and a functioning voice in daily life. One example of a possible improvement would be the provision of voice amplifiers in club or association gatherings with older participants.

Consequences for social participation

Discussions about the singing voice were frequent among the participants in all three groups. There could be several reasons for this observation. First, most participants had current or previous experience of choir singing. Secondly, many people unfamiliar with voice use often associate "voice" primarily with singing. Third, earlier research implies higher vocal demands during singing than speaking [15]. Participants agreed that singing is positive for the aging voice. However, not everyone unfamiliar with singing was keen to try. New difficulties with the singing voice due to voice changes also created a feeling of frustration. Some had had to switch parts and one participant had quit singing in a choir altogether. Singing in a choir provides an important social context for many people and can improve psychosocial health among older adults [30]. Being unable to sing any longer may have implications on social life. Social consequences were prevalent among participants in the groups, both in the context of singing and speaking. Many participants chose to avoid social events in order to conceal an unstable or unpredictable voice. In some cases, participants had asked their spouse to speak in their place. This is a sign of limited social participation [31]. Social participation with regard to voice in older adults has to our knowledge never been investigated in the literature. On the other hand, research on communicational participation and social participation in relation to communication is scarce, and research into social participation and communication among older adults has only been conducted in other contexts such as stroke rehabilitation [32]. Social participation has a direct impact on psychosocial mechanisms. In turn, limited social participation can have psychological and neurohormonal consequences [33]. A functioning voice is therefore of utmost importance for general health, and further research should be done to investigate the connection.

The complexity of voice problems

Evidence supports voice therapy as a way to improve the voice of older adults with a confirmed diagnosis of presbyphonia [11,34,35]. However, the results of our study reveal an interest among older adults to get more information about voice problems and interventions in relation to aging. Fear of stigma, underestimation of the problems, and under-acceptance of voice deterioration with age had caused many of the participants not to seek voice therapy. The participants discussed the positive effects of listening to peers with the same voice problems as themselves. During the interviews, many participants asked for input from the others. Discussions during meetings with peers can therefore be suggested as an intervention for addressing stigma. Additionally, information should be provided about the possible vocal improvements which voice therapy can bring, in order to motivate older adults to seek professional help. As Wong and Ma [4] suggest, most efforts should focus on the "young-old" to enhance quality of life at an early stage.

The participants had many ideas regarding their voice, even though they had not sought treatment. Accordingly, older adults have a need for voice treatment, training, or at least information and advice. Participants requested voice training at the activity center and mentioned speech language pathologists as possible sources of improvement and information about vocal difficulties due to aging.

The voice of older adults is physically a result of laryngeal status and respiratory function [18]. The present study highlights the voice of older adults as complex when it comes to social and emotional factors. Our results show a diversity of symptoms and severity. A single solution is most probably not the answer to a complex problem. Instead, this qualitative study implies that individualized assessments and treatments are preferable for older adults with voice problems, as the participants experienced a wide range of problems and limitations. Vocal fatigue, communication, and social participation are factors that must be taken into account in clinical settings as well as in society.

Strengths and limitations

Research concerning the voice among non-treatment-seeking, otherwise healthy older adults is scarce. The results were similar in all three focus groups, which suggest high individual reliability. Although it is not possible to generalize information from qualitative studies, transferability is possible [22].

The fact that participants where relatively active should be taken into account, and therefore it can be assumed that

they used their voice more than the average for their age group. However, non-treatment-seeking individuals have been discussed as having lower vocal demands than those seeking treatment [14].

The initial intention was to have an even distribution between women and men. This goal was not attainable, partly because there were more women than men at the activity center. Since no notification was made concerning those who declined participation or did not meet the inclusion/exclusion criteria, no conclusion can be drawn regarding reasons to not participate. Still, some ideas regarding non-participants come to mind. Individuals with even greater voice problems than the participants in this study might have been limited by shame or fear of revealing an unpredictable or poor voice in the focus group setting. This assumption enhances the reliability of this study. Additionally, discussions concerning health-related problems and individual voices could hypothetically be a sensitive topic to discuss with strangers and therefore could inhibit participation.

Authors one and three conducted unrelated coding and thematic content analysis, resulting in similar themes. The usage of NVivo12 made it possible to deepen the analysis and improve the overview of the data.

Conclusions

According to the results of this study, the voice is an important communication tool for older adults. However, vocal changes due to aging affect communication and seem to interfere with social participation. Further studies should be conducted regarding how older adults experience their voice and the healthy aging voice in general, not least in relation to what can be done to ameliorate communicative surroundings. Quoted statements imply that information about the aging voice and voice exercises could be helpful and appreciated at activity centers for older adults. Speech language pathologists are valuable for counteracting problems and improving vocal health; however, older adults use strategies to improve their subjective experience of vocal health despite not having sought care for voice problems.

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