

Reliability and validity of a questionnaire on self-evaluation of dysarthria

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Introduction

Dysarthria is the most common of the acquired expressive communication disorders: it comprises a group of speech disorders resulting from disturbances in muscular control due to impairment of any of the basic motor processes involved in the execution of speech. It is reported that dysarthria is present in approximately 33% of all patients with TBI, 8% of individuals with cerebral palsy and varies from 19% to 100% in individuals with degenerative neurological diseases. Dysarthria can range in severity from disorder that is so mild that it is only noticeable during rapid speech or the variation is only perceived by the speaker, to a disorder so severe that no functional speech is present. In fact dysarthria can interfere with all aspect of communication: as a result there can be a great deal of unhappiness, frustration and misunderstanding not only for the person with disease, but also for the person who comes into contact with. Dysarthria-specific outcomes tool is needed to understand how variations in treatment modalities affect both speech physiology and the human experience of living with speech disorders.

From the early nineties research focus on the results of rehabilitation has shifted from efficacy to outcome. Apart from biological aspects, emotional and social dimensions have become more and more important; focus of interest is not only on the results measured clinically or with quantitative instruments but also on the point of view of the patient himself. In the literature there is a paucity of data on health outcomes from the patients' perspective, such as quality of life (QOL) and patient satisfaction. QOL is a state of well-being and it's comprises: the ability to fulfil usual and desired physical role, and social activities, the physiological effectiveness with which one performs usual and desired activities and satisfaction with health care services related to treatment.

In vocology a large number of scales for the assessment of voice related QOL have been published in the last few years; self-assessments such as the Voice Handicap Index (VHI), the Voice Outcome Survey, the Voice-Related Quality of Life and the Outcome Scale are currently used throughout the world to assess dysphonia as an outcome measure, and the VHI has been translated into different languages, is used in many countries, and has been applied to various patient groups with dysphonia. In a similar way, self-assessment scales as the MD Andreson Dysphagia Inventory (MDADI) and the Swallowing Quality of Life (SWAL-QOL) have been introduced in the field of deglutology. On the contrary, in the field of motor speech disorders, the clinical evaluation is perspective, instrumental or acoustic, at least at the moment, while no valid and reliable scales exist to measure dysarthria related QOL.

In 1994 Yorkston et al. published a questionnaire on dysarthria from the point of view of the dysarthric patient (Appendix A). Even if the questionnaire has already been translated in Italian, a self-assessment scale has not been published. The original questionnaire contains 100 items and is subdivided in four areas: speech characteristics of the word (13 items); situational difficulty (30 items); compensatory strategies (30 items); and perceived reaction of others (27 items).

The aim of this study was to develop a new self-assessment scale of dysarthria in Italian, based on the questionnaire of Yorkston et al; the scale should be fast and easy to use, as well as, reliable and valid for the adult patient.

Scale development and test-retest reliability

Fifty patients, 25 men and 25 women, with a mean age of 58.4 ± 13.7 years (range 18-79) were included in the study. Inclusion criteria were: cognitive ability be within normal limits (MMSE>24) and age over 18 years.

The neurological disease underlying dysarthria was of different origin (stroke, traumatic brain injury [TBI], multiple sclerosis [MS], amyotrophic lateral sclerosis [ALS], Parkinson's Disease

[PD], Friedreich Ataxia); the type of dysarthria according to Darley, Aronson and Brown subdivision were also different (flaccid, spastic, hypokinetic, ataxic and mixed dysarthria). For each patient the severity of the dysarthria was assessed according to the Therapy Outcome Measure (TOM), published by Enderby (1997).

The patients were divided on the basis of the type of dysarthria; for each group the age, the severity of dysarthria and the cognitive level are reported in Table 1.

Table 1: age, severity of dysarthria and cognitive level for each group of dysarthria type. Age is reported as mean \pm standard deviation, dysarthria severity and MMSE values as mean and range. The original questionnaire of Yorkston et al. was translated into Italian, back-translated into English and compared with the original items by a qualified professional translator. For each statement of the questionnaire the patients could answer always (score = 4), often (score = 3), occasionally (score = 2), seldom (score = 1), never (score = 0), depending on how often he experiences that situation or feeling in his daily life. The questionnaire was administered to each patient admitted to the study; the patient completed the questionnaire alone. Internal consistency was verified through Cronbach's alpha coefficient.

Results

Each patients managed to fill the whole questionnaire, without the need of any help. In Table 2 total and subscales scores for each group of patients are reported.

Table 2: total and subscales scores obtained from administration of the 100 item Yorkston questionnaire. The scores are reported as mean \pm standard deviation.

(SC = speech characteristics of the word, SD = situational difficulty, CS = compensatory strategies, PR = perceived reaction of others).

For majority of our population remunerative work was not part of daily life activities and therefore those items were unanswered. For this reason we eliminated various items regarding work activities, before calculating Cronbach's alpha coefficient.

The Cronbach's values of each items are reported in Table 3; Cronbach's values have been calculated separately for each of the four subscales.

Table 3: Cronbach's values of each items. Subscale SC (= speech characteristics of the word) has 13 items; subscale SD (= situational difficulty) has 30 items; subscale CS (= compensatory strategies) has 30 items; subscale PR (= perceived reaction of others) has 27 items.

After the application of the Cronbach's alpha coefficient, 26 items with $\alpha > 0,50$ were obtained, while all the items with $\alpha < 0,50$ were eliminated, except 11 items with $\alpha < 0,50$, but considered clinically significant. Those items that resulted non relevant and redundant were also eliminated. With these 37 items and three new items, a new questionnaire was constructed (Appendix B).

Discussion and future development

There are far fewer texts and research papers related to the physiological and acoustic bases, methods of assessment, and treatment of dysarthria than other speech or language disorders. According to Yorkston et al. there remains an urgent need to develop measures that reflect the quality of communication participation in adults with acquired neurologic communication disorders. The ability to communicate effectively is a critical factor in living safely and independently in the community and in obtaining the highest quality health care.

Considerable progress has been made in measuring the acoustic signal and the task-based profile of patients with dysarthria. However, the value of these clinical advances is incompletely understood because outcome assessment have been few and have been limited largely to physiologic, speech and intelligibility outcomes. The challenge for dysarthria researcher and clinicians is to continue to make measurement developments towards a synergistic and thorough compendium of health outcomes tools specific to dysarthria. As a step toward achieving this end, the item development project for the dysarthria self-assessment questionnaire has been presented. In the next future, fifty subjects with dysarthria that meet the same criteria as above and with a score from 2-4 on the TOM by Enderby, will be recruited for the second step of the study. The

subjects will compute the new questionnaire twice with a week between the two sittings. Internal consistency of the new questionnaire will be evaluated using Cronbach's alpha. That concluded the questionnaire will again be administered to 30 subjects with a negative history for neurological as well as head and neck pathologies. Based on the results obtained, reliability and validity of the questionnaire will be further evaluated.

QUESTIONNAIRE ITEMS
(Yorkston et al., 1994)

CHARACTERISTIC

- My speech will improve if I work hard
- I can usually make strangers feel at ease with me
- I am skilled at handling difficult speaking situations
- My speech is difficult for strangers to understand
- My speech problem is so severe that it is difficult for my family to understand
- My speech is slow
- My speech is sometimes too loud or too soft
- I have difficulty speaking when I am in a hurry
- My speaking is poorer when I am tired
- My speech sounds unnatural
- My voice sounds hoarse or harsh
- My speech is going to improve
- My speech has a nasal quality

SITUATIONAL DIFFICULTY

- You are chatting with someone while riding in a car
- You are at a social gathering with friends, music is playing in the background, and someone starts a casual conversation
- You are talking with your family after dinner
- You are explaining a new project to someone at work
- You are at a restaurant ordering food or drinks
- You are talking on the telephone with a new client
- You are attempting to convey important information over the telephone in an emergency
- You are talking to someone in your family while you are watching TV or listening to the radio
- You are asking for information in a group or class
- You are talking to a co-worker in an office
- You are in a quiet room at home talking on the telephone
- You are at a dinner party with several other people
- You are speaking with someone who is obviously in a hurry
- You are at a meeting with several other people
- You are at home and you are talking to someone in another room
- You are having a conversation at a social gathering while others are talking nearby, the room is dimly lit
- You are talking with a friend or family member in a quiet room
- You are talking with your doctor about a medical problem
- You are trying to resolve a billing problem with a clerk
- You are asking a bus driver for directions
- You are talking with a close friend about emotional issues
- You are upset and trying to get a point across

- You are trying to resolve a conflict with someone
- You are making a difficult request of someone
- You are explaining to a friend that something exciting has happened
- You are angry and you want to let someone know it
- You are greeting an old friend
- You are telling a family member what you would like for breakfast
- You are trying to get the attention of someone in another room
- You are giving a formal presentation to a group

COMPENSATORY STRATEGIES

- I let my family or friends “translate” because I hate repeat when strangers don’t understand
- At parties or other social gatherings I try to stay in a well-lighted area so people can see me
- If someone has misunderstood part of what I have said, I repeat the message more clearly
- I let people know the topic of the message at the beginning of the conversation
- I don’t change topics without letting my listener know
- I tell others to signal me when they are having difficulty understanding
- I make sure that people face me when I am speaking to them
- If someone seems irritated when they cannot understand me, give up
- I avoid talking to strangers because of my speech problems
- When I am involved in an important conversation, I turn off the radio, TV, or other noise sources
- If my listener does not understand, then I try to repeat more clearly
- I speak louder when people have difficulty understanding me
- I stop frequently to let people ask me questions about what I have said
- I ask people to repeat what I have said to them so that I know they have understood
- I get people’s attention before trying to communicate with them
- I always watch the listeners so I can tell when they do not understand me
- I tend to be merely a listener in conversations so I won’t have to speak
- In difficult speaking situation, I try to position myself so that I can be seen when I am talking
- I try to speak more precisely when people are having difficulty understanding me
- If someone has misunderstood part of what I have said, I will write or spell out the message
- If someone has misunderstood me, I use different wording when I repeat the message
- I tell people not to interrupt until I am finished
- I ask people to be patients when talking with me
- I tend to avoid situations when I think I will have trouble being understood
- If people are not watching me as I speak, I move so that they can see me
- I avoid trying to talk with someone at a distance or someone in the next room
- I speak more slowly when people have difficulty understanding me
- When people have trouble understanding me, I ask them to watch me as I speak
- When I first meet strangers I try to let them know about my speech problem
- I signal to my listeners when I want a turn in the conversation

PERCEIVED REACTIONS OF OTHERS

- People remind me to slow down or look at them when I speak
- People work hard to make communication easy for me
- Because of my speech problem, people treat me as if I am not very bright
- Others get irritated with my speech
- Others ignore me if they do not understand what I am saying
- Others treat me like a child when it comes to communication
- Others have taken over making telephone calls for me
- People tend to get impatient because I speak slowly
- Others praise me when I try to speak for myself
- Others interrupt me when they are having difficulty understanding me
- People treat me as if I can't do the job when I know that I am able
- People fill in words for me before I have a chance to complete my thought
- Others order for me in a restaurant , although I would prefer to do it myself
- Other criticize me for the way I talk
- People include me in conversation despite my speech problem
- Members of my family let me know when they do not understand me
- People paraphrase what I say to let me know that they understand me
- My family is patient when trying to communicate with me
- People leave me out of conversations
- People treat me as if I am hard of hearing
- People speak louder when talking to me because they think I have a hearing problem
- Family or friends tell me to not work so hard trying to speak
- Others have taken over my responsibilities because of my speech problem
- Others laugh or joke about my speech problem
- People encourage me to speak for myself
- When I am talking, people pretend to understand
- Others say they will speak for me whenever I want them to do so

Appendix B

This are statements that many people used to describe their speech and the effects of their speech on their lives. Circle the response that indicates how frequently you have the same experience.
(Never = 0 ; Seldom = 1 ; Occasionally = 2 ; Often = 3; Always = 4)

	NEVER	SELDOM	OCCASIONALLY	OFTEN	ALWAYS
CHARACTERISTICS					
1. My speech is difficult for strangers to understand					
2. My speech is slow					
3. My speech is sometimes too loud or too soft					
4. My speech sounds unnatural					
5. My speech problem is so severe that is difficult for my family to understand					
6. I have difficulty speaking when I am in a hurry					
7. My speech is worse in the evening					
8. I use a great deal of effort to speak					
9. My speech has a nasal quality					
10. I run out of air when I talk					
SITUATIONAL DIFFICULTY					
1. You are attempting to convey important information over the telephone in an emergency					
2. You are talking to a family members while you are watching TV or listening to the radio					
3. You are asking for information in a group or class					
4. You are at a dinner and you have a conversation with several other people					
5. You are speaking with someone who is obviously in a hurry					
6. You are talking to someone that is in another room					
7. You are upset and trying to get point across					
8. You are trying to resolve a conflict with someone					
9. You are making a difficult request of someone					
10. You are explaining to a friend that something exciting has happened					

COMPENSATORY STRATEGIES					
1. I don't change topics without letting my listener know					
2. I make sure that people face me when I am speaking to them					
3. I ask people to repeat what I have said to them so that I know they have understood					
4. I get people's attention before trying to communicate with them					
5. Even when the conversation regards me, I prefer to listen rather than participate actively					
6. In difficult speaking situation, I try to position myself so that I can be seen when I am talking					
7. If someone has misunderstood me, I use different wording when I repeat the message					
8. If people are not watching me as I speak, I move so that they can see me					
9. I avoid trying to talk with someone at a distance or someone in the next room					
10. If someone seems irritated when they cannot understand me, I give up					
PERCEIVED REACTIONS OF OTHERS					
1. Because of my speech problem, people treat me as if I am not very bright					
2. Others get irritated with my speech					
3. Others ignore me if they do not understand what I am saying					
4. Others treat me like a child when it comes to communication					
5. People tend to get impatient because I speak slowly					
6. People fill in words for me before I have a chance to complete my thought					
7. People leave me out of conversation					
8. People speak louder when talking to me because they think I have a hearing problem					

9. Others have taken over my responsibilities because of my speech problem					
10. When I talk people pretend to understand me					

TAB. 1

Pat Grouping	Age	Dysarthria severity	MMSE
ALS	62.1 ± 13.1	3.5 (2-5)	29.8 (29-30)
FRIEDRICH	34.5 ± 24.7	4.0 (3-5)	28.0 (25-30)
MS	57.6 ± 8.2	2.6 (1-4)	29.3 (27-30)
PARKINSON	66.5 ± 10.5	2.6 (1-4)	29.5 (28-30)
STROKE	64.8 ± 8.2	2.6 (1-4)	28.6 (24-30)
TBI	29 ± 0	2.4 (0-3)	28.0 (25-30)
OTHERS	59.3 ± 12.5	3.0 (3-4)	29.0 (27-30)

TAB. 2

Type of dysarthria	n.	Total score	SC	SD	CS	PR
FLACCID	2	140.5 ± 28.9	28.5 ± 0.7	49.5 ± 23.3	41.5 ± 2.12	21.0 ± 8.48
ATAXIC	4	149.2 ± 47.4	24.5 ± 11.3	35.5 ± 24.3	48.5 ± 7.0	40.7 ± 18.0
MIXED	29	179.8 ± 52.2	29.5 ± 6.7	50.0 ± 20.3	63.6 ± 19.3	36.5 ± 17.3
SPASTIC	9	137.8 ± 55.1	25.5 ± 4.8	33.3 ± 20.9	56.7 ± 22.1	22.2 ± 15.2
HYPOKINETIC	6	189.3 ± 38.4	34.3 ± 7.1	45.1 ± 21.1	68.8 ± 13.6	41.0 ± 14.2
Total	50	169.4 ± 52.18	28.9 ± 7.0	45.2 ± 21.2	60.9 ± 18.9	34.2 ± 17.2

TAB.3

	CP	SD	SC	PRA
Item 1		0,29	0,43	0,33
Item 2	-0,26	0,40	0,33	0,40
Item 3	0,45	0,08	0,02	0,69
Item 4	0,57	0,33	0,34	0,53
Item 5	0,26	0,63	0,59	0,71
Item 6	0,47	0,51	0,39	0,62
Item 7	0,50	0,50	0,56	0,62
Item 8	0,22	0,21	0,45	0,57
Item 9	0,31	0,54	0,32	
Item 10	0,47	0,41	0,38	0,42
Item 11	0,39	0,41	0,12	
Item 12	-0,35	0,63	-0,01	0,51
Item 13	0,41	0,43	0,36	0,70
Item 14			0,51	0,50
Item 15		0,38	0,61	0,25
Item 16		0,41	0,45	0,45
Item 17		0,11	0,38	0,58
Item 18		0,24	0,60	-0,03
Item 19			0,26	0,61
Item 20			0,37	0,55
Item 21			0,18	0,61
Item 22		0,53	0,43	0,59
Item 23		0,58	0,49	0,50
Item 24		0,77	0,48	0,21
Item 25		0,50	0,51	
Item 26		0,71	0,52	0,69
Item 27			0,44	0,10
Item 28			0,43	
Item 29		0,36	0,18	
Item 30		0,28		