A Descriptive study of Portrayal of Speech and Language Disorders in YouTube Videos

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ABSTRACT

The present study assesses the quality of the YouTube videos related to speech and language disorders. This assessment is carried out by examining videos' content, type of their content, source of these videos, their meta data, and their level of action-ability & understandability. For the said purpose, the researcher selects 15 most frequently viewed You-tube videos. The quality of selected videos is assessed at two levels: Firstly, by identification and analysis of types of informational content and Meta data (thumbs up, source, length and viewership). Then factors of action-ability and understand ability are examined through Patient Educational Material Assessment tool. Lastly, the descriptive statistics of the first level are obtained through SPSS while NVIVO software is utilized to carry out qualitative analysis of level two. The findings of the study, obtained through analysis, show that uploaded content has low understand ability and action-ability scores (less than 70%) This study also highlights negative effects of low quality YouTube videos on the general health of population suffering from speech and language disorder. It eventually proposes a filter which can be employed by YouTube to scrutinize each speech and language disorders related videos before giving approval for upload.

Keywords: Understand ability, Action-ability, PEMAT AV, Autism, Aphasia, Dysarthria

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INTRODUCTION

According to American Speech and Hearing Association "*A speech disorder is a condition in which a person has difficulty producing or forming the spoken sounds necessary for communication. This might make it difficult to understand the child's words.*" (Shahin , Zafar , & Ahmad , 2019)**.** The following are common speech disorders:

- Disorders of articulation, Disorders of phonology, Disfluency, Resonance problems or voice disorders. In children, speech issues vary from language disorders. Someone with a language impairment has trouble with:

❖ Communicating their meaning or message to others (expressive language)

❖ Recognizing the message sent by others (receptive language) (Dashtipour, Tafreshi, & Lee, 2018)

CAUSES:

One of the most common ways we communicate with others is through speech. It appears spontaneously, along with other markers of normal development and growth. Speech and language disorders are widespread among preschoolers. (Turk , 1985)

- Disfluencies are conditions in which a person repeatedly repeats a sound, word, or phrase. The most significant disfluency is stuttering. It might be brought on by:

- Genetic alterations, Emotional tension, Any brain injury or infection

Other family members may suffer from articulation and phonological difficulties. Other factors are:

- Issues with the anatomy or shape of the muscles and bones that produce spoken sounds. Cleft palate and teeth issues are examples of these modifications.

- Damage to sections of the brain or nerves that govern how muscles work together to make speech (such as from cerebral palsy).

- Hearing impairment (Sunderajan & Kanhere, 2019).

Symptoms:

Disfluency

The most prevalent kind of disfluency is stuttering as mentioned by Arpitha et al. in 2020

Disfluency can cause the following symptoms:

After the age of four, sounds, words, or portions of sentences or phrases are repeated. *(I desire...I desire my doll.) (I... I notice you.)*

Adding (interjecting) additional sounds or phrases (We went to the...uh...store.)

lengthening words (I am Boooobbby Jones.)

Disorder in Articulation

The youngster can't generate clear speech sounds, such as saying "coo" instead of "school."

Certain sounds (such as "r," "l," or "s") may be persistently altered or modified (for example, whistling the "s" sound).

People may find it difficult to comprehend you if you make mistakes (only family members may be able to understand a child) (WOJCIECHOWSKA & SAMBOR, 2018).

Phonological abuse:

As predicted given their age, the youngster does not employ any or all of the speech sounds to make words.

Words' final or initial sound (usually consonants) may be omitted or modified.

The children may have no difficulty pronouncing the same sound in other words (for example, a child may pronounce "boo" for "book" and "pi" for "pig," but not in this case).

Voice problems:

Other issues with speech include: hoarseness or raspiness in the voice, Voice may break in and out. Speech may sound strange because too much air is exiting through the hose (hyper nasality) or too little air is flowing out of the nose (hypo nasality) (Wulff, Dalton, & Wessel, 2022).

YouTube:

YouTube is the most widely viewed video sharing platform with its local version available in 91 countries having 80 different languages with more than 95% of people on internet using it. According to Global Media Insight (2022) compared to other social media websites Twitter, Facebook video streaming site Netflix, user engagement with YouTube relatively high i.e. 74% adult users. There are almost 500 hours of video uploads on YouTube every minute. It is the second Largest search engine after Google. YouTube began as a medium of uploading and sharing videos in 2004. It works as a remediate of television in the world of networking publics that all of us inhabit in 21st century (Grusin, 2009) .

According to Miles (2021), YouTube is defined by combining several important elements, it is a social networking site, advertising as well as video sharing site. Creation of YouTube for the video sharing services has lead people to upload education related videos as well. Not only in education, YouTube is also being used in politics (Carlson, 2008) in medical field (Fernan, 2008) along with methods of gathering and using data from YouTube (Shah, 2009) and different probabilities of teaching. Social media sites have brought a revolution in and a new direction to health care, it is also a platform that public, patients and health professionals use to communicate health issues and their possible health improving outcomes ("A New Dimension of Health Care: Systematic Review of the Uses,," 2013). However, the authenticity of the content on YouTube is always questionable. Study conducted on the content of patient health information reveals that current topics related to quality information related to patient health are not clear albeit master driven, prominence driven or heuristic-driven measures are utilized to appraise the nature of recordings, there should be alert applied while transferring health related recordings. ("Identifying measures or assessing qualityof youtube videos on Patient Health," 2013). It also depends upon the literacy rate of the community whether they are educated enough to deny the false or unauthentic content uploaded. According to recent survey the literacy rate in Pakistan is 60% out of which 20.6% out of whole people use social media. Word-of-mouth refers to information spreading through personal contacts, whether online or offline (Leskovec et al., 2006). This form of diffusion, or cascading, has long been regarded as in important mechanism by which information can reach large populations, possibly influencing public opinion (Berger and Milkman, 2013; Katz and Lazarsfeld, 1955). It has the potential to support the adoption of innovations (Rogers, 1995), highlight new products within the market (Bass, 1969) or stimulate brand awareness (Keller and Berry, 2003). So, to dig out the problems related to authenticity of the Speech related disorders is checked with scientific procedures and observations and finding the answers of the questions related to

following the content blindly and to create awareness about health risks among speech therapists, researchers and population that is being affected most.

Research questions:

The study is having following questions:

1. How to assess the quality of videos related to Speech and Language disorders on YouTube?

2. What type of information filter by YouTube must be there for health related videos?

Methodology:

Population and Sampling:

Target population in this mix method technique was YouTube speech and language disorder videos also the speech therapists, patients, parents/relatives and psychologists. Sampling technique used was **Purposive Sampling.** Researchers utilize the expression "**Purposive sampling** " also known as judgement sampling, is the purposeful selection of a participant based on their personal characteristics. (Bernard , 2006)

Instrumentation:

The type of instrument used was Interviews from parents, speech therapists or psychologist. The thematic analysis of the interviews was the done through N-VIVO. The Tool used for assessing the met data of the videos was PEMAT AV (Patient Education Material Assessment Tool AV. PEMAT is an organized tool used for evaluating and comparing understandability and action-ability of patient's education material. There are 2 versions for PEMAT. PEMAT P for printable materials and PEMAT AV for audio visual materials. In this research PEMAT AV is used. It has 3 options agree 1, disagree 0 and not applicable for some options. Next, the relationship between different variables was analyzed through SPSS version 26.

Data collection:

The primary source of information for data collection was YouTube as it is the most viewed search engine after google after asking questions from parents of affected children and speech therapists along-with psychologists of how they search for the related disorder (Appendix A). Interviews were recorded. The thematic analysis of interviews was done through NVIVO. While numerous web-based media stages have demonstrated to be transient, YouTube has developed to turn into the world's second most seen website.("Researching Youtube," 2018). The videos collected were on speech and language disorders in Children. The particular speech and language disorders selected were Autism Spectrum Disorder ASD, Aphasia, Dysarthria and Apraxia. These developmental disorders occur due to damage or injury inside the brain. 15 videos from YouTube related to the speech and language disorders were downloaded from YouTube. These videos are in Urdu as well as English Language and their Meta data (likes, dislikes, viewership, recent) type of information i.e. causes, source, treatment, diagnosis, research, policy, associated disorder taken from National Institute of deafness and communication disorder. The PEMAT AV is used for collection of quantitative data (Appendix B). The tool is take from the Agency for Healthcare Research and Quality. The tool is originally designed to assess the action-ability and understandability of the Audio Visual and Printed health

material. To determine the type of information required by the parents, speech therapists and psychologists regarding speech and language disorders, categories from fact sheets for parents were compiled as suggested by National Institute for Deafness and Communication disorders. The categories include signs and symptoms, causes, treatment, diagnosis, services provided in the videos for families of affected children, research, policy, associated disorders and resources (for contacting the relevant organization)

Data Analysis Procedure:

Interviews' analysis through NVIVO:

Interviews were held with parents, speech therapists and psychologists for the search of videos related to Apraxia, Dysarthria, Aphasia and Autism. This qualitative data was analyzed using NVIVO for thematic analysis. The study also examines the meta-data (source of the video, likes dislikes, type of information) from the YouTube. Firstly, the source of videos is analyzed i.e. consumers, professionals or internet- based clips.

Quantitative Analysis through PEMAT AV:

After the interviews for the qualitative data, the present study examined its data using PEMAT AV version 10 for quantitative data analysis. The tool is used to measure action-ability and understandability of the audio visual education material. The tool is suggested by Agency for healthcare research and Quality. It was developed both for lay man and professionals alike and has an open access. It has 17 items for Audiovisual material. The tool contains 25 questions out of which 1-14 are for understandability of the content question 15-17, 23,24 were not followed as they are not related to the study.

Question 20-22 and 25 are for the action-ability of the content. The tool will identify the content, word choice and style, organization layout and design and use of visual aids for understandability and also about the mentioned actions to be followed by the viewers.

The agree and disagree responses were shown to 2 speech therapists and after their review and rectifying the responses and score of understandability and action-ability, the results were further analyzed through SPSS.

Video content analysis through SPSS:

After the completion of the meta-data analysis through PEMAT, further analysis was done through the guide or form for parents available at the National institute of Deafness and communication disorder's webpage. There are 9 categories on which the content of videos can be analyzed. These are signs and symptoms, causes, treatment, diagnosis, services, research, policy, associated disorders and resources.

Meta Data, understandability and action-ability analysis through SPSS:

After the analysis of the video content the statistical analysis was done through SPSS version 26. First of all, the descriptive statistics for meta data i.e. thumbs up, number of views and length of videos was done. After that, the relation between thumbs up and number of views was found through spearman correlation. Then normality test was performed between number of views, and thumbs up. As there are only 15 variables so the Shapiro-wilk test will be analyzed instead of Kolmogorov Smirnov which is applicable on more than 2000 data variables. The variables are not normally distributed as p-value is

greater than 0.05 so null hypothesis is rejected and showed that variables are independent of each other. So, the analysis needed non-parametric tests for the variables.

To determine the difference between understandability and action-ability mean difference was taken of both the variables.

Findings:

First of all, the normality test was performed on the variables. I.e. Thumbs up, number of views and length of the videos. The Shapiro Wilk test. The P value and the ability plus suggested that these variables. Violated the assumptions of normality as P value of some of the variables is greater than 0.05 and P value of thumbs up. A number of years for professional is less than 0.05. Which requires non-parametric test. So non parametric tests were performed. On the meta data (Thumbs up length of videos and number of views) And also on the understand ability and Action ability scores.

Meta data:

There were total 15 videos out of which 7 were created by professionals, 4 of those videos were created by consumers and remaining 4 were, internet based. The overall length of Videos is 1 hour 51 minutes. The total thumbs up are 1529 with the total number of views 62901. The data showed that more people viewed consumer uploaded videos rather than professional videos. Sum of number of views for professional videos is 20983 and 41984. In the next step Kruskal Wallis H test was performed. To analyze the difference between Three video sources. i.e. Professionals, consumers and Internet based. No significant difference was found between source group and thumbs up as chi square=2.229 p value is greater than 0.05. however, a significant difference between length of videos and number of views was found with the source group as chi square= 8.543 and 5.529 respectively and p value is less than 0.05.

The Spearman correlation test between the four variables show that there is a strong correlation between length of videos and source. As p value is less than 0.05. No other strong correlation was found between any of the 4 variables. Other than length of videos and source, no correlation was found between thumbs up and length of videos and number of views as p value >0.05. There was no other statistically significant association noticed between these variables.

Video content analysis:

Table 1: Video content analysis:

Categories	All %	Professional%	Consumer %	Internet based %
Signs and symptoms	100	100	100	100
Causes	100	46.7	26.7	26.7

Treatment	60	85.7	75	0
Diagnosis	40	77.8	22.2	0
Services	13.3	28.6	0	0
Research	40	71.4	25	0
Policy	0	0	0	0
Associated disorders	60	100	50	0
Resources	13.3	28.6	0	0

The table showed percentages of the categorized content advised by National Institute of Deafness and communication disorders. Signs and symptoms and causes were explained in every video (100%). But the videos lagged in mentioning diagnosis, services and resources 40%, 40% and 13.3% respectively. No policy was mentioned for early intervention of the disorders (0%). Talking about the source of the uploaded content, professional videos were far better than consumer or internet based videos as the had more percentage in all the categories of the video content.

Table 2: percentages of agree and disagree responses.

PEMAT AV factors and items	Agree	Disagree	Not applicable
Subscale: understandability			
Topic: content			
1. The material makes its purpose completely evident.	3 (20%)	12 (80%)	0
Topic: word choice and style			
Item 3: the material uses common everyday language	11 (73 %)	4 (26.6%)	0
4. Medical terms are used only to familiarize audience with the terms. When used, medical terms are defined.	11 (73 %)	4 (26.6%)	0
5. The material uses the active voice.	15 (100%)	0	0
Topic: ORGANIZATION			
8. The material breaks or "chunks" information into short sections.	7 (47%)	6 (40%)	2
9. The material's sections have informative headers.	7 (47%)	1 (6%)	7
10. The material presents information in a logical sequence.	14 (93%)	1 (6%)	0
11. The material provides a summary.	1 (6%)	14 (93%)	0
TOPIC: LAYOUT AND DESIGN			
12. The material uses visual cues (e.g., arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to key points.	1 (6%)	4 (26.6%)	10
13. Text on the screen is easy to read.	2 (13.3%)	3 (20%)	11
14. The material allows the user to hear the words clearly (e.g., not too fast, not garbled).	15 (100%)	0	0
TOPIC: USE OF VISUAL AIDS			
18. The material uses illustrations and photographs that are clear and uncluttered.	2 (13.3%)	5 (33%)	8

19. The material uses simple tables with short and clear row and column headings.	0	4(26.6%)	11
ACTIONABILITY			
20. The material clearly identifies at least one action the user can take.	10 (66.6%)	5(33%)	0
21. The material addresses the user directly when describing actions.	10 (66.6%)	5(33%)	0
22. The material breaks down any action into manageable, explicit steps.	7 (46.7%)	8 (53%)	0
25. The material explains how to use the charts, graphs, tables or diagrams to take actions.	0	5 (33%)	10

By looking at the agree and disagree responses of each item from every videos. It is evident that. The highest percentage and 100% goes for the active voice usage item number 5 and hearing of the words clearly. 93% presents information in a logical sequence, which is item number 10.

The highest percentage for the disagree response is the material providing of the summary item number 11. 93% of the videos does not fall under this category. 80% of the videos did not conveyed their purpose completely, which is item number 1.

Understandability and action-ability:

Understandability and action-ability:

Videos	Understandability%	Action ability%	Source
1	70	100	Professional
2	69	75	professional
3	44	100	Consumer
4	88	100	Professional
5	54	25	Consumer
6	86	0	consumer
7	57	0	Internet based
8	71	0	Internet based
9	63	67	professional
10	75	67	Internet based

11	75	67	Professional
12	46	67	Professional
13	56	100	professional
14	69	0	Consumer
15	86	100	Internet based

Table 3 represents the individual percentages of action-ability and. Understand-ability. The mean action-ability score is 57%. While the mean total Score for understand ability is 67% which showed the poor understand-ability and action-ability of the videos the overall score for a video to have all the required information is 70% for understand-ability as well as action-ability. The present analysis showed the poor understand ability and action-ability of the videos uploaded. However, the understand ability scores were very close to be considered at acceptable.

The value of Kruskal-Wallis H test 1.11 is greater than chi square value 1.08, hence, null hypothesis was rejected and data showed that there is a correlation between understandability and video source. Also the p value is less than 0.05. for action-ability the Kruskal-Wallis H value 0.94 is again greater than chi square =0.565 but p value is greater than 0.05 so there is moderate correlation between source of videos and action-ability.

Discussion

Up till now we have understood that parents and other family members seek information about their related speech and language disorder through online. Due to this fact, this study has tried to sort out the source (professional, consumer, internet based), content along with understandability and action-ability of the uploaded content on the second most used search engine YouTube. The results of the study showed that the total length of selected videos was 1 hour 51 minutes, number of views 62901 and 1529 thumbs up.

Most of the videos were uploaded by professionals. But the most viewed videos were. Consumer uploaded videos and also they had more likes than other two sources of the uploaded content. It means that result results point towards the popularity of consumer videos, but not for professional or internet based videos. Even though the number of uploaded videos by professionals were more but the viewership word was more towards consumer based videos. Which according to the results have Listed quality of the uploaded material then professionals.

Moving on towards understand ability and action ability. The main action ability of the videos was 67%. The items that had more percentage had used voice, the clear audio and the use of common language, due to which the users may have assessed the information. However, no significant relation was identified in action ability and action-ability scores were 57%. Talking about the source of videos and understand ability and action-ability the understand ability of the videos of the professionals was higher than those uploaded by consumers are Internet based videos. This leads to another observation that as viewers

mostly viewed the consumer videos, so it is evident that they had more inclination towards false or inappropriate information. According to this study, there was no relationship found between action ability and the source of the videos. Which shows that viewers were unable to easily identify what action they must take for their related speech and language disorder. Almost all the videos from all the sources mentioned causes in signs and symptoms. However, there was a lack of mentioning of treatment and diagnosis in the videos.

There were almost no researches mentioned and no policy for the early intervention of the disorder was explained. Overall the professional videos had more quality videos according to the content, as compared to other two sources. The overall scores for understand ability 67%, and action ability 57% show that there is need of lot of improvement. This study also revealed that professionals must have seen the videos. So, any of the family members or any patient who visits them, they need to inform them about appropriate and evidence based information. They should also develop eHealth literacy, website or a trusted YouTube channel. So that patient may not go for the unauthentic videos that are uploaded just for getting likes and views. Speech therapist and psychologist can also tell their clients to seek, find, understand and critically evaluate information they find on the Internet.

Conclusion

After analysis of results and embracing the fact that families with SLDs reach online sources for information about particular disorder it was seen that videos had been uploaded through different sources. The results indicated that every source had signs and symptoms and causes but the videos had low percentage of diagnosis. Further videos must be uploaded with proper diagnosis and other services. The low scores of understandability and action-ability indicate that there is a room for a lot of improvement. Professionals along with members of health care must take part in analyzing the videos and they should make families aware of the valid and reliable sources of videos. They should play an active role in the assessment of the content uploaded to online search engines and should discard the unauthentic and inappropriate information.

References:

Arpitha, V., Samvrudhi, K., Manjula, G., Sowmya, J., & Thanushree, G. B. (2020). *Diagnosis of Disordered Speech using Automatic Speech Recognition*.

Ahmed, S. N., Abbas, F., & Qureshi, A. M. (2021). The use of social-networking sites in English language education: An exploratory study using SWOT analysis technique. *PSYCHOLOGY AND EDUCATION*, *58*(1), 4640-4650.

Bass, F. M. (1969). A new product growth for model consumer durables. *Management science,* *15*(5), 215-227.

Bernard,H.R.(2006). Methods in Anthropology. *Qualitative and Quantitative, 42(*4), 13-25.

Dashtipour, K., Tafreshi, A., Lee, J., & Crawley, B. (2018). Speech disorders in Parkinson's disease: pathophysiology, medical management and surgical approaches. *Neurodegenerative disease management, 8*(5), 337-348

Leskovec, J., Adamic, L. A., & Huberman, B. A. (2007). *The dynamics of viral marketing. ACM Transactions on the Web (TWEB), 1*(1), 5-25.

Pluta-Wojciechowska, D., & Sambor, B. (2018). About Popular Though disputable Tongue exercises in the case of Peripheral disorders of Articulation. *Logopedia, 47*(1), 235-246

Shahin, M., Zafar, U., & Ahmed, B. (2019). The automatic detection of speech disorders in children: Challenges, opportunities, and preliminary results. *IEEE Journal of Selected Topics in Signal Processing, 14*(2), 400-412.

Sunderajan, T., & Kanhere, S. V. (2019). Speech and language delay in children: Prevalence and risk factors. *Journal of family medicine and primary care, 8*(5), 1642

Tarar, I. A., Khan Rana, A. M., & Abbas, F. (2021). Right to Education: Comparative Study of Constitutional Contours, Legislative Initiatives and Institutional Arrangements in India and Pakistan. *Elementary Education Online*, 19(3), 3365-3371.

Turk, C. (2002). *Effective speaking: Communicating in speech*. Routledge

Wulff, N. B., Dalton, S. O., Wessel, I., Arenaz Bua, B., Löfhede, H., Hammerlid, E., ... & Homøe, P. (2022). Health-Related Quality of Life, Dysphagia, Voice Problems, Depression, and Anxiety After Total Laryngectomy. *The Laryngoscope, 132*(5), 980-988.