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Societal knowledge of stuttering in Saudi population

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ABSTRACT

Stuttering is a common disease that exists in all societies and ethnic groups of differing incidence rates. The aim of this study was therefore to investigate the social awareness of stuttering in the Saudi community on the basis of a questionnaire. We will try to examine the incidence, triggers and duration of stuttering in the Saudi community. This study is descriptive, a questionnaire-based analysis involving the active participation of the Saudi community. The questionnaire, exposure to Stuttering, was addressed and balanced in terms of ethnicity, age and schooling. A total of 1,000 Saudi people was invited to participate in this questionnaire-based survey, with only 878 participants between 18 and 65 years of age participating in the study; most of them were males. In this survey, 79.5% of the Saudi population studies, most of them male (60.5% vs. 25.0% female) claimed that more than 6% of the population had stutters. There was also a substantial correlation between the degree of schooling, sex, and person experience and attitudes towards stuttering. It was often assumed that younger ages were prone to higher instances of stuttering relative to older ages (≤18 years vs 18 years of age). In comparison, handiness and IQ scores did not indicate any correlation with the occurrence of stuttering among the Saudi community. In conclusion, this questionnaire-based analysis, participants of both sexes claimed that more than 6% of the Saudi population were impaired by stuttering, which increased dramatically in males relative to females. They also claimed that both handiness and IQ ratings had little impact on the rate of stuttering. However, scant research on the effects of stuttering has scarcely been reported. Future experiments of effective public education preparation and health actions for stuttering are also welcome.

1. Introduction

According to the International Classification of Diseases and other disorders, CID-10, Stuttering is characterized by frequent repetitions or prolongations of sounds, syllables or words, or by frequent hesitations or pauses (Cruz and Kalil, 2013). Recently, it was reported that stuttering is a multifactorial communicational disorder in which the flow of speech is interrupted by repetitions, prolongations, and abnormal stoppages of sound and syllables (Almudhi, 2016). Clinically, a lack of cerebral dominance for the neural mechanism of language has been suggested in people who stutter which is rarely accepted (Barbosa, 2005). However, genetics as clinical aspect, under a model of autosomal recessive heritage with a significant linkage on specific chromosome showing as a factor associated with this complex disorder (Raza et al., 2010). Several research studies documented the impact of anxiety-related and sociability effects as the main disorders prevailed in the stuttering population (Crutchfield et al., 2016; Furnham and Davis, 2004; Packman, 2012). It as reported that stuttering among younger or older individuals considered to be a negative experience during social interactions leading to limited communication (Crutchfield et al., 2016). Thus, it can be stated that stuttering is a social problem that could happen in all cultures in association with physical components (Packman, 2012). Some countries have developed socially oriented studies related to the disorder to examine the knowledge and information that the local population has about stuttering (Van Riper, 1973; Ming et al., 2001; Louis et al., 2010; Fonseca and Nunes, 2013). Also, it was suggested that attitudes within different populations are not uniformly more

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negative or positive, and diversify according the studied populations. It was concluded that the interaction between nationality, religion, native language, culture and ethnicity may influence the differences in attitudes between people who are stuttering (Van Riper, 1973; Ming et al., 2001; Louis et al., 2010; Fonseca and Nunes, 2013; Smith et al., 2014; Valente et al., 2017).

No studies have been conducted in Saudi Arabia, and we aim to perform the first one in the Kingdom. The purpose of this study was to examine the societal knowledge of stuttering based on a questionnaire in the Saudi population. We will try to investigate the prevalence, incidence, and frequency of stuttering within friends, family, and relatives in the Saudi population.

2. Materials and methods

2.1. Participants and procedure

This study was designed as a questionnaire-based study. Initially, the study targeted 1000 participants. However, only 878 participants were included in the study based on the inclusion criteria, which included basic knowledge of and attitudes towards people who stutter (PWS). People who stutter were also excluded. All of the recruited participants were from Riyadh city, Saudi Arabia. Demographic and the distribution of the respondents were shown in Table 1. Ethical approval was granted for the study from CAMS (CAMS 088–37/38), King Saud University, Riyadh, Saudi Arabia.

2.2. Development of the survey instrument

This study was conducted based on a well-designed questionnaire after reviewing several alternative questionnaires (Louis et al., 2010; Fonseca and Nunes, 2013; Smith et al., 2014; Valente et al., 2017; de Britto Pereira et al., 2008; Vanryckeghem et al., 2001; Abdalla and Louis, 2012). This project was designed as a novel research program exploring the societal knowledge and attitudes of the public on stuttering. Since the purpose of this research was to report on societal knowledge of stuttering and access to information sources, only data pertaining to 44 items of a larger questionnaire were reported. The items were consisted of one open-ended question and several forced-choice questions. The items exploring knowledge of stuttering and PWS were selected for use from pre-existing surveys (Crowe and Walton, 1981; Gabel et al., 2004; Ruscello et al., 1994; Boyle, 2013).

Other questions were related to media influences, were developed specifically for this study. After translating the items into Arabic, it was judged by a well-experienced speech language pathologist (SLP) to confirm the relevance and appropriateness of the questionnaire items to the study purpose. Based on the feedback suggested by them, changes were made to improve the survey's clarity, ease of completion, importance of content, and readability. These changes were included structural modifications (such as order of the items, organization of the items, etc.), font changes to improve the readability, and shortening the true/false section. The resulting survey included questions intended to solicit the respondents' demographic information (including gender, occupation, age range, race/ethnicity, education, and experiences with PWS) and their basic knowledge of and attitudes towards PWS. For readability, final version was validated by managing to a group of 135 participants to evaluate whether any contradiction for the respondents occurred. They did not mention any issues about misunderstanding the things or they survey process. The final version of the questionnaire was in Arabic, with a total of 44 items (Fonseca and Nunes, 2013; Smith et al., 2014; Valente et al., 2017; de Britto Pereira et al., 2008; Vanryckeghem et al., 2001; Abdalla and Louis, 2012; Crowe and Walton, 1981; Gabel et al., 2004; Ruscello et al., 1994; Boyle, 2013).

2.3. Data analysis:

SPSS 16.0 was used for data analysis. Chi square test, cross tabs and logistics regression were carried out using SPSS (Khan et al., 2014). Every question was analyzed using logistics regression, chi square test and cross tabs test based on gender. Results obtained from SPSS, were interpreted according to p-values. Alpha value was considered as 0.05 for each analysis. If obtained p-value is greater than 0.05 null hypotheses cannot be rejected. If p-values are lower than 0.05 null hypothesis can be rejected (Khan et al., 2019).

3. Results

The current study focuses on providing information on the level of awareness about stuttering among the general population in Saudi Arabia considering different aspects. The comparison is done based on age, gender, occupation and educational qualification using logistic regression, chi-square test, and cross tabs test. A total of 1000 Saudi citizens were invited to participate in this questionnaire-based study, only 878 participants with age range of 18–65 years old were recruited in this study; most of them were men (71.8% Vs 28.2 for women) (Table 1). The distribution of the studied participants according to the age group was as follows: 82.5% were younger than 25 years of age and 13.7% were older than 50 years of age, and only 3.8 of the participants were at age of 50 years old or more. In terms of the education level, it was found that 65.6% of the included sample was university highly educated and 30.9% was high school educated along with 3.5% of the participants with lower levels of education (Table 1). According to knowing sources of stuttering, all participants showed closely related ratios ranges (84.8% to 65.71%) in reading and following information's relating to stuttering from originally knowing scientific and media sources as shown in Table 1

In this study, the distribution of stuttering (PWS) according to gender, age, causes of stuttering, and IQ scores among Saudi population were studied (Fig. 1). Based upon the opinion of the responders, PWS significantly ($p = 0.001$) increased in male than females especially in younger ages ($\leq$18 Yrs vs > 18 Yrs) (Fig. 1A & B). Also,

Table 1
Frequency distribution of the respondents in terms of age, sex, educational level, knowing sources of stuttering.

Parameters	N (%)
Sex	
Male	630 (71.8)
female	248(28.2)
Age (years)	
Young (18–24 years old)	724 (82.5)
Adult (25–50 years old)	120 (13.7)
Elderly (> 50 years old)	34 (3.8)
Educational level	
Basic (elementary level)	31 (3.5)
High school	271 (30.9)
University	576 (65.6)
knowing sources of stuttering	569 (64.8)
Internet	573 (65.3)
Magazine	573 (65.3)
Newspapers	574 (65.4)
TV programs	577 (65.71)
Books	572 (65.1)
Profession journals	572 (65.1)
Lectures/ presentations	571 (65.0)

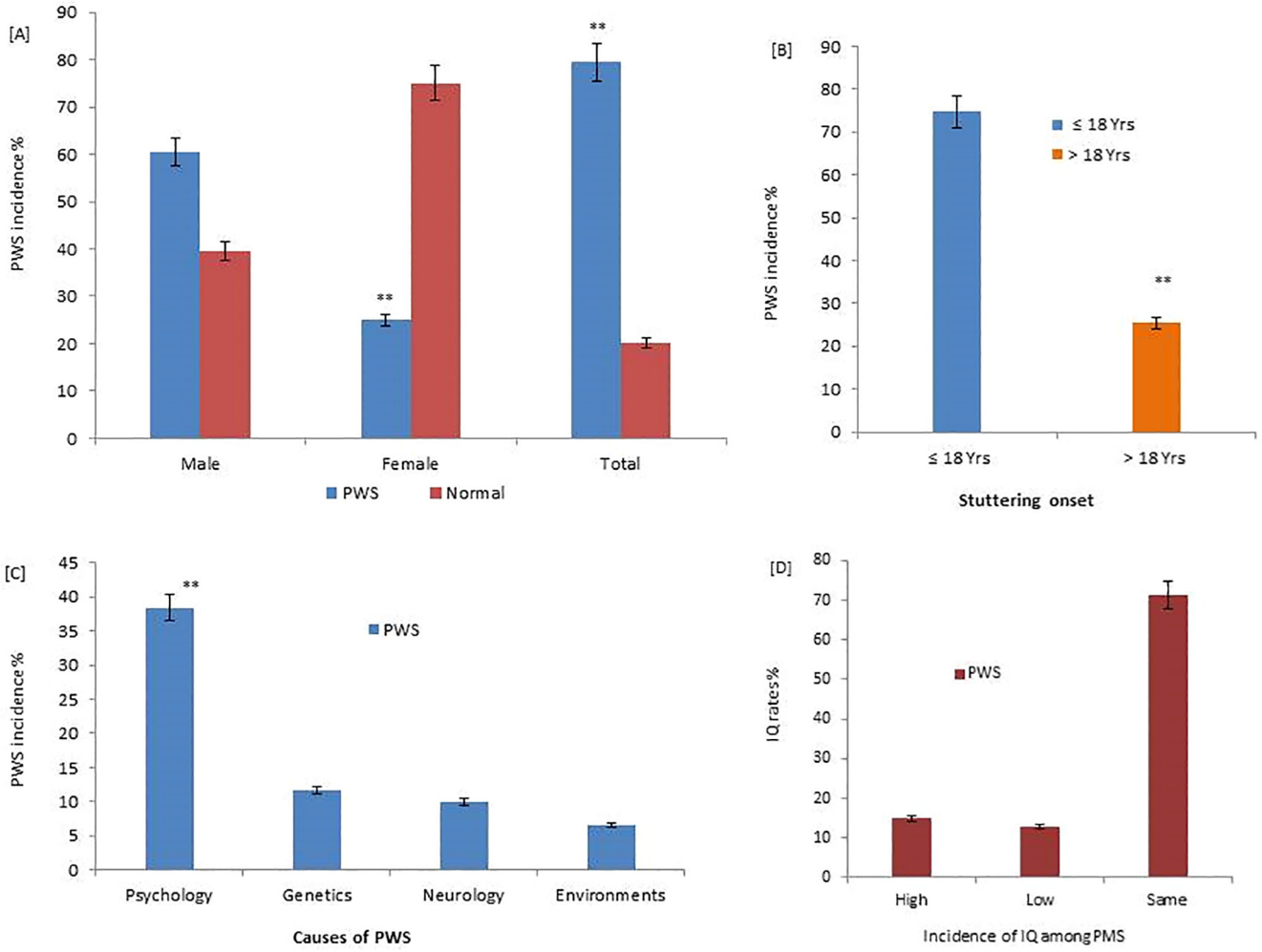

Fig. 1. Distribution of stuttering (PWS) according to gender [A], age [B], causes [C], and IQ [D]. Chi square test [P = 0.001]. Based up on the opinion of the responders, PWS significantly (p = 0.001) increased in male than females especially in younger ages (≤18 Yrs vs > 18 Yrs) [A&B]. Also, according to their opinion, psychology and genetic disturbance were significantly (p = 0.001) for the incidence of PWS along with little influence of neurological and environmental factors on PWS scores [C]. There is no significant difference (p greater than 0.05) or association between IQ scores and the incidence of PWS whereas most of PWS subjects have the same IQ levels as normal speakers [D].

according to their opinion, psychology and genetic disturbance were significantly (p = 0.001) for the incidence of PWS along with little influence of neurological and environmental factors on PWS scores (Fig. 1C). There is no significant difference (p > 0.05) or association between IQ scores and the incidence of PWS whereas most of PWS subjects have the same IQ levels as normal speakers (Fig. 1D). Accordingly, the attitudes of the association of handedness, the language, accents, cultures, races, treatment, and recovery of PWS were significantly evaluated among Saudi population (Fig. 2). There is no effect (p < 0.05) of handedness, all languages, accents, cultures, and races on the incidence of PWS among Saudi population (Fig. 2A & B). Also, the visualized opinion of the participants showed that PWS can be recovered or treated (Fig. 2C).

4. Discussion

The present study showed interesting data on the awareness and incidence of stuttering among Saudi population. In this study, 79.5 of the study Saudi populations most of them were men (60.5% vs 25.0% for female) believed that more than 6% of the population suffering from stutter. Also, significant association was found between the education levels, sex, and individual's knowledge and attitudes toward stuttering. Also, it was believed that, younger ages are subjected to higher ratios of stuttering compared to older ones (≤18 Yrs vs > 18 Yrs). Also, handedness and IQ scores showed no association with the incidence rates of stuttering among Saudi population.

It was reported that stuttering among younger or older individuals considered to be a negative experience during social interactions leading to limited communication Crutchfield et al., 2016 and it could happen in all cultures in association with physical components (Packman, 2012). Some countries have developed socially oriented studies related to the disorder to examine the knowledge and information that the local population has about stuttering Van Riper, 1973; Ming et al., 2001; Louis et al., 2010; Fonseca and Nunes, 2013. Also, the interaction between nationality, religion, native language, culture and ethnicity may influence the differences in attitudes between people who are stuttering (Van Riper, 1973; Ming et al., 2001; Louis et al., 2010; Fonseca and Nunes, 2013; Smith et al., 2014; Valente et al., 2017). Our study is in line with several studies which indicate that the prevalence of stuttering among populations attributed significantly with psychological or environmental factors (Bloodstein and Ratner, 2008), however little ratios of stuttering were linked with genetic disorders (Cox et al., 2005). Others reported that the problem may

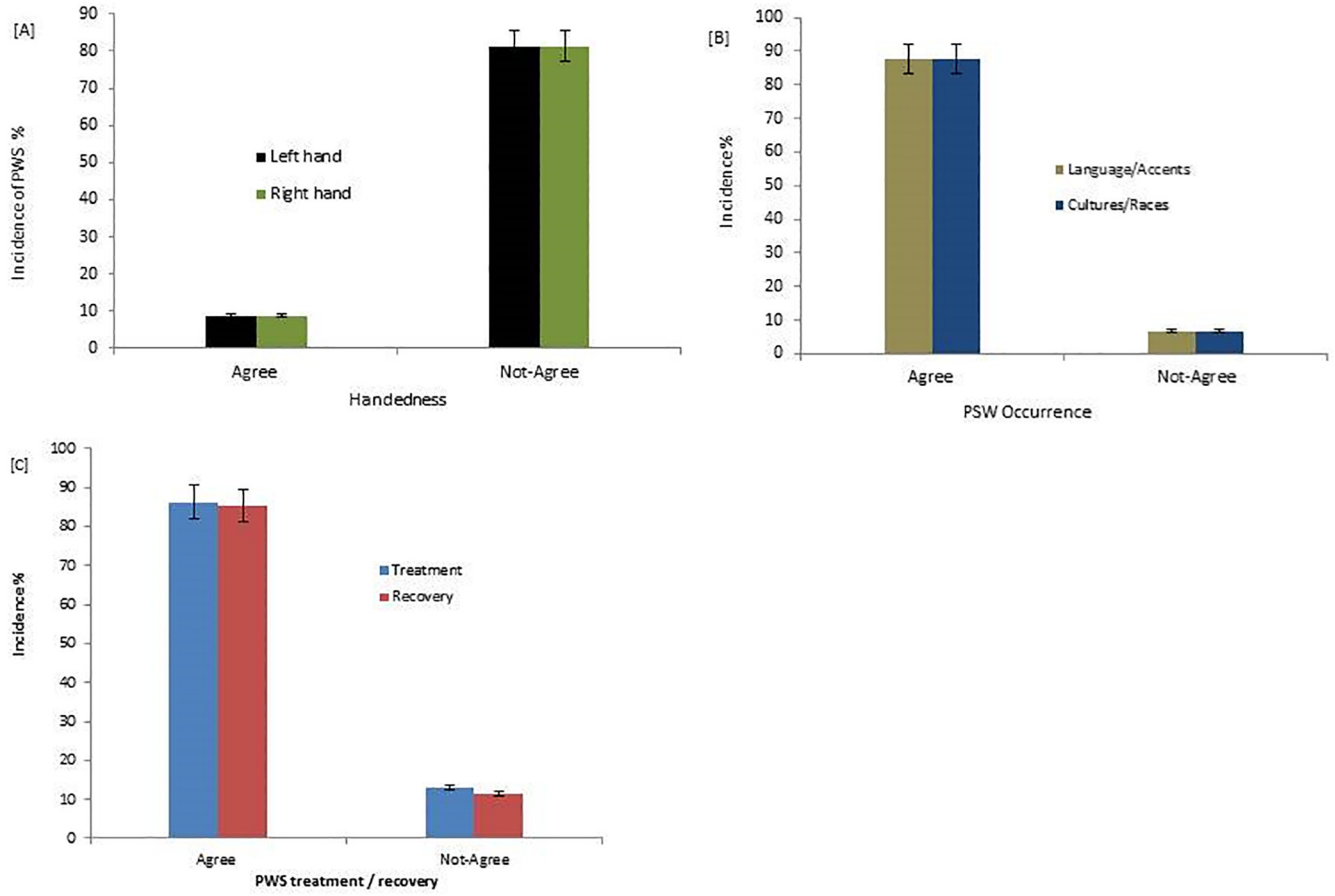

Fig. 2. The attitudes of the association of handedness [A], the language, accents, cultures, races [B], treatment, and recovery [C] of PWS among Saudi population. Chi square test [P = 0.001]. There is no effect ($p < 0.05$) of handedness, all languages, accents, cultures, and races on the incidence of PWS among Saudi population [A&B]. Also, the visualized opinion of the participants showed that PWS can be recovered or treated [C].

be because of an abnormality in the oral cavity and they considered surgical procedures as a solution for treatment (Safwat and Sheikhany, 2014; Healey, 2010).

In this study, 79.5 of the study populations most of them were men believed that more than 6% of the population showing a high estimated prevalence of stutter which occurs more in men than women. Similarly, it was reported previously that stuttering has a prevalence of 1% among the world population, with an incidence of 5% in younger ages as many children can recover with or without speech therapy (Barbosa, 2005; Valente et al., 2017; Andrews et al., 1991). In this study, also handedness and IQ scores showed no association with the incidence rates of stuttering among Saudi population. Whereas, the respondents in this study consider that person with stutter has intelligence equal to that of normal speakers. Previous research studies showed that articulation defects and stuttering occurred more frequently in the younger ages and in boys more so than in girls. Also, association of the disturbances in intellectual, neurological aspects as well as handedness occurred rarely in PWS (Vanryckeghem et al., 2001; Fonseca and Nunes, 2013; Koutsodimitropoulos et al., 2016; Louis et al., 2016).

5. Conclusion

In this questionnaire-based study, the participants of both genders believed that more than 6% of the Saudi population is suffering from stutter which significantly increased in men than women. Also, they believed that both handedness and IQ scores have no effects on the rate of stuttering. However limited information's about the consequences associated with stuttering were rarely identified. Thus, future studies with good planning of public education and health actions for stuttering are appreciated.

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References

Cruz, D.M.O., Kalil, F.L.H., 2013. Absenteísmo Odontológico Registrado na Unidade do SIASS da Universidade Federal da Bahia após Perícia Oficial. Cognitio/pós-graduação UNILINS. (1)
Almudhi, A., 2016. Innovation of speech hand synchronization as a treatment in adults who stutter. J. Speech Pathol. Therapy. 1 (2).
Barbosa, L.M.G., 2005. Noções básicas sobre a gagueira: suas características, sua etiologia e as teorias sobre sua natureza. Conhecimentos essenciais para atender bem a pessoa com gagueira. 2, 17–32.
Raza MH, Riazuddin S, Drayna D. Identification of an autosomal recessive stuttering locus on chromosome 3q13. 2–3q13. 33. Human genetics. 2010;128(4):461-3.
Crutchfield, R., Wang, X., Crutchfield, R., Wang, X., 2016. The Perceptions of Stereotypes of People Who Stutter in Hispanic University Students. Clin. Arch. Commun. Disorders 1 (1), 36–41.
Furnham, A., Davis, S., 2004. Involvement of social factors in stuttering: A review and assessment of current methodology. Stammering Res. On-line J. Published British Stammering Assoc. 1 (2), 112.
Packman, A., 2012. Theory and therapy in stuttering: A complex relationship. J. Fluency Disorders 37 (4), 225–233.
Van Riper, C., 1973. The treatment of stuttering. Prentice Hall.

Ming, J.X., Jing, Z., Wen, Z.Y., Borsel, J.V., 2001. Public awareness of stuttering in Shanghai China. Logopedics Phoniatrics Vocol. 26 (4), 145–150.
St. Louis KO, Filatova Y, Coşkun M, Topbaş S, Özdemİr S, Georgieva D, et al. Identification of cluttering and stuttering by the public in four countries. International journal of speech-language pathology. 2010;12(6):508-19.
Fonseca, N.T.M., Nunes, R.T.D.A., 2013. Conhecimento sobre a gagueira na cidade de Salvador. Revista CEFAC. 15 (4), 884–894.
Smith, K.A., Iverach, L., O'Brian, S., Kefalianos, E., Reilly, S., 2014. Anxiety of children and adolescents who stutter: A review. J. Fluency Disorders 40, 22–34.
Valente, A.R.S., Louis, K.O.S., Leahy, M., Hall, A., Jesus, L.M., 2017. A country-wide probability sample of public attitudes toward stuttering in Portugal. J. Fluency Disorders 52, 37–52.
de Britto Pereira, M.M., Rossi, J.P., Van Borsel, J., 2008. Public awareness and knowledge of stuttering in Rio de Janeiro. J. Fluency Disorders 33 (1), 24–31.
Vanryckeghem, M., Hylebos, C., Brutten, G.J., Peleman, M., 2001. The relationship between communication attitude and emotion of children who stutter. J. Fluency Disorders 26 (1), 1–15.
Abdalla, F.A., Louis, K.O.S., 2012. Arab school teachers' knowledge, beliefs and reactions regarding stuttering. J. Fluency Disorders 37 (1), 54–69.
Crowe, T.A., Walton, J.H., 1981. Teacher attitudes toward stuttering. J. Fluency Disorders 6 (2), 163–174.
Gabel, R.M., Blood, G.W., Tellis, G.M., Althouse, M.T., 2004. Measuring role entrapment of people who stutter. J. Fluency Disorders 29 (1), 27–49.
Ruscello, D.M., Lass, N.J., Schmitt, J.F., Pannbacker, M.D., 1994. Special educators' perceptions of stutterers. J. Fluency Disorders 19 (2), 125–132.
Boyle, M.P., 2013. Assessment of stigma associated with stuttering: Development and evaluation of the self-stigma of stuttering scale (4S). J. Speech Language Hearing Res.
Khan IA, Movva S, Shaik NA, Chava S, Jahan P, Mukkavali KK, et al. Investigation of Calpain 10 (rs2975760) gene polymorphism in Asian Indians with Gestational Diabetes Mellitus. Meta Gene. 2014;2:299-306. Epub 2015/01/22. doi: 10.1016/j.mgene.2014.03.001. PubMed PMID: 25606412; PubMed Central PMCID: PMCPMC4287813.
Khan IA, Jahan P, Hasan Q, Rao P. Genetic confirmation of T2DM meta-analysis variants studied in gestational diabetes mellitus in an Indian population. Diabetes Metab Syndr. 2019;13(1):688-94. Epub 2019/01/16. doi: 10.1016/j.dsx.2018.11.035. PubMed PMID: 30641791.
Bloodstein, O., Ratner, N.B., 2008. A handbook on stuttering Clifton Park. Delmar Thomson, NY.
Cox N, Roe C, Suresh R, Cook E, Lundstrom C, Garsten M, editors. Chromosomal signals for genes underlying stuttering: A preliminary report. 7th Oxford Dysfluency Conference; 2005.
Safwat, R.F., Sheikhany, A.R., 2014. Effect of parent interaction on language development in children. Egyptian J. Otolaryngol. 30 (3), 255.
Healey EC, editor What the literature tells us about listeners' reactions to stuttering: Implications for the clinical management of stuttering. Seminars in speech and language; 2010: © Thieme Medical Publishers.
Andrews, G., Morris-Yates, A., Howie, P., Martin, N., 1991. Genetic factors in stuttering confirmed. Arch. Gen. Psychiatry.
Fonseca, N.T.M., Nunes, R.T.D.A., 2013. Knowledge about stuttering in the city of Salvador. Revista CEFAC 15 (4), 884–894.
Koutsodimitropoulos, E., Buultjens, M., Louis, K.O.S., Monfries, M., 2016. Speech pathology student clinician attitudes and beliefs towards people who stutter: a mixed-method pilot study. J. Fluency Disorders 47, 38–55.
Louis, K.O.S., Sønsterud, H., Junuzović-Žunić, L., Tomaiuoli, D., Del Gado, F., Caparelli, E., et al., 2016. Public attitudes toward stuttering in Europe: Within-country and between-country comparisons. J. Commun. Disord. 62, 115–130.