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A Comparative Overview of Evidence-Based Treatment of Stuttering in Bulgaria and in the USA and Canada

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Abstract

Introduction: The move towards evidence-based practice (EBP) requires speech-language pathologists (logopedists) to understand the types of studies that build an evidence base for the field as well as the standards for assessing the quality of evidence.

Objectives: This article discusses the conceptual and methodological issues associated with EBP in Bulgaria, the USA, and Canada related to clinical stuttering intervention. This article discusses how the movement towards the current high-level standards of practice established in North America may challenge some of the traditional Bulgarian beliefs regarding stuttering treatment.

Method: Theoretical overview and analysis of the existing literature data sources including systematic meta-analysis articles on EBP on stuttering.

Results: The study outlines the steps of EBP accepted in SLP. Thirteen systematic reviews and meta-analyses are discussed concerning the application of research evidence to clinical decision making. These issues remain problematic for Bulgarian logopedists who received their training before or during the recent professional shift from a special education subspecialty to a health profession specialty as represented by speech-language pathology (SLP).

Conclusions: The professional bodies that govern clinical practice in the Bulgarian health fields are not currently guided by EBP concepts. In Bulgaria, there is no evidence-based framework for the prevention, diagnosis, and treatment of stuttering as there is in the USA and Canada. In Bulgaria EBP stands as a fundamental way to promote changes appropriate for SLP as a health profession.

Key words: *evidence-based practice (EBP), levels of evidence, stuttering, fluency disorder, clinical outcome, speech-language pathology, logopedics*

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1. Introduction

For Bulgarian clinicians who treat speech and language problems, the concept of evidence-based practice (EBP) is a new one. The National Agency of Evaluation and Accreditation oversees the quality of university clinical programs at the Bachelor, Masters, and Ph.D. level. However, Bulgarian logopedists (speech-language pathologists, SLPs) are not yet required to demonstrate the ability to: (i) recognize the needs, abilities, values, preferences, and interests of individuals and their families to whom they provide clinical services; (ii) acquire and maintain the knowledge and skills that are necessary to provide high quality professional services, including knowledge and skills related to EBP; (iii) evaluate prevention, screening, diagnostic procedures, protocols, and measures to identify maximally informative and cost-effective diagnostic and screening tools; (iv) evaluate the efficacy, effectiveness, and efficiency of clinical protocols for prevention, treatment, and enhancement using criteria recognized in the EBP literature in the leading countries in that area (Georgieva, 2010). Practicing logopedists are not registered by the Bulgarian Health Profession Council and membership in the Bulgarian Society of Logopedists is not required. Consequently, the implementation of the EBP has been problematic, both for clinical practice and in research development.

The American Speech-Language-Hearing Association (ASHA) and the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA) both have a strong tradition of EBP application since the early 1990s (ASHA, 2005; Bernstein Ratner, 2006, 2018; Dodd, 2007; Orlikoff, Schiavetti, & Metz, 2015; Plante, 2004). The influence of EBP within Canadian SLP came early as a consequence of evidence-based medicine, which was largely conceptualised by epidemiologist David Sackett and his medical colleagues at McMaster University in Hamilton, Ontario, Canada (Sackett, 1981; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Thoma & Eaves, 2015). In the USA, the advent of EBP was spurred by affiliated advances in evidence-based medicine as promoted by the American Medical Association as well as a growing focus on

translational science among a multitude of allied health professions, both domestically and abroad. By 2006, Pietranton had already noted over 18 000 citations of the term *evidence-based* in published articles in the professional scientific literature. Fibiger and his colleagues (2008, p. 7) analysed health and human services for persons who stutter in Bulgaria and other East-European countries, concluding that, for adults who stutter (AWS), “efficacy and effectiveness measures are underdeveloped and resources, social support, and information are lacking” (Fibiger, Peters, Euler, & Neumann, 2008, p. 7). In the same publication, the authors further postulated that “Therapy outcome evaluation, however, seems insufficient compared with outcome evaluation assessment and best practice norms in Western countries” (p. 6). The Bulgarian health system does not offer evidence-based treatment for patients with communication disorders, including AWS (Georgieva, 2005).

With respect to stuttering, there are a limited number of publications related with EBP in Bulgaria (Georgieva, 2014; Georgieva, 2015a; Georgieva, 2015b; Georgieva & Stoilova, 2018; Georgieva, Simonska, & Stoilova, 2018). However, the widespread adoption of EBP in the USA and elsewhere is leading to an increase in the evidence base and a better understanding of which treatment approaches show the greatest efficacy and effectiveness (Bothe, 2003; Davidow, Bothe, & Bramlett, 2006; Finn, 2003; Irani, Gabel, Daniels, & Hughes, 2012; Kent, 2006; Lee & Hunsley, 2015; Lickley, 2007; Neumann, Euler, Bosshardt, Cook, Sandrieser, & Sommer, 2017; Onslow, 2003; Perez & Stoeckle, 2016; Turkstra, Norman, Whyte, Dijkers, & Hart, 2016). *Efficacy* is the probability of benefit to individuals in a defined population from a technology or procedure applied for a given condition under ideal conditions of use, whereas *effectiveness* measures the probability of benefit to individuals in a defined population from a technology or procedure applied for a given condition under average conditions of use (Pietranton, 2006, p. 50).

Although there is no universally accepted clinical approach for all AWS, EBP “dictates that clinicians integrate the latest scientific evidence with their clinical expertise and the values of the family into the clinical decision-making process” so as to customise acceptable, appropriate, and effective man-

agement of stuttering for the individual client (Byrd & Donaher, 2018).

It is important to remember that EBP entails more than merely referring to published stuttering literature, which as Blomgren and his colleagues (2005) note, “remains characterised by primarily ‘assertion-based’ or ‘opinion-based’ treatments [that] by definition are based on unverified treatment techniques and/or procedures.” Indeed, effective EBP requires a critical examination of research evidence to assess its strength, quality, and appropriateness for supporting practice decisions.

2. Objectives of the Study

This article discusses the conceptual and methodological issues associated with EBP implementation in Bulgaria and the United States of America (USA) and Canada related to clinical stuttering intervention. The article discusses how the movement towards the current high-level standards of practice established by the American Speech-Language-Hearing Association (ASHA) may challenge some of the traditional Bulgarian beliefs regarding stuttering treatment. In particular, the authors discuss the differential application of EBP with respect to outcome and the application of evidence to clinical decision making in the treatment of stuttering over the past decade (2009-2019).

3. Method

As EBP has only recently been introduced in Bulgarian practice, the present article serves as a theoretical comparative overview of the existing literature, including available systematic meta-analyses (SMA) of evidence-based stuttering treatment.

Inclusion criteria:

(i) SMAs, as a quantitative approach for the systematic summary of results from previous research studies, play a supporting role in the planning process of three Bulgarian research studies during the period 2009-2019. These provided evidence to answer specific clinical questions, such as: What assessment and treatment to apply for people who stutter? How to plan our research studies for the target population – children and adults? Which outcomes to measure?

(ii) Evidence was collected by means of electronic searches of stuttering articles using the Web of Science research database.

In this way, we sought to avoid the traditional narrative review of the thousands of articles related to stuttering. The application of EBP in the USA and Canada was used as a basis of comparison because EBP in the field has been highly developed in these countries for more than two decades.

EBP is a decision-making process that integrates external scientific evidence with practitioner expertise and client perspectives to improve clinical outcomes (Dollaghan, 2007; Haynes & Johnson, 2009; Orlikoff, Schiavetti, & Metz, 2015). The challenge of SLP practice and research in Bulgaria and USA is the matter of selecting the appropriate methodology for the stuttering evidence-based assessment and therapy. Similar to other healthcare specialities, the variability between individuals with stuttering guarantees that the process of selecting an appropriate research methodology will not be straightforward (Baxter et al., 2016; Pietranton, 2006).

The International Classification of Functioning, Disability, and Health (ICF) of the World Health Organization (WHO, 2001) was used in Bulgaria during the period 2009-2019 as the framework for the development of measurement tools and the conduct of the scientific outcome research. Outcomes refer to the effects attributed to a specific treatment or intervention. They may also be thought of as changes in the lives of clients and their environment(s) as a result of rehabilitation. Outcome measures are tools (e.g. instruments, questionnaires, scales, rating forms) that are used to reveal or identify client outcome. Such measures document change in client characteristics, functional abilities, or behaviours over time (see, for instance, Coyte, 1992; Frattali, 1998, 2013; Golper, 2013; Grover & Holt, 2017).

Yaruss and Quesal (2004, 2006) adapted the ICF framework to the study of stuttering, with the explicit goal of developing a model that could be used to support the measurement of stuttering treatment outcomes. This adaptation describes how the stuttering can be viewed in terms of several interacting components like stuttering causes, impairment in body function, the speaker's affective, behavioral, and cognitive reactions to disorder and impact of the disorder on the speaker's quality of life. *Impairment* relates to the observable stuttering behaviors, *contextual factors* concern features such as avoidance and the effect of envi-

ronment, while *limitations* or *restrictions* refer to the impact that the stuttering behaviours have on daily life.

4. Results

As there is no universally accepted definition of stuttering and the Bulgarian Society of Logopedists (BSL) has no officially accepted terminology, researchers from the South-West University (SWU, Blagoevgrad, BG) Stuttering Research Center adopted the following combined definition of stuttering:

Disturbance in the normal fluency and time patterning of speech. Primary characteristics include one or more of the following: (a) audible or silent blocking; (b) sound and syllable repetitions; (c) sound prolongations; (d) interjections; (e) broken words; (f) circumlocutions; or (g) words produced with an excess of tension. Associated behaviors or secondary characteristics include the habitual use of speech musculature or of other body parts which a stutterer uses along with the primary

characteristics. The disturbance may be at the level of neuromuscular, respiratory, phonatory, or articulatory mechanisms. Dysfluencies are so numerous that they exceed the normal number or degree for the individual's age, sex, or speaking situations (Nicolosi, Harryman, & Krescheck, 2004, p. 295).

This combined definition was selected because it “presents highly specific behavioural components and introduces the idea of etiology as timing disturbance” (Shapiro, 2011). The definition also makes explicit reference “to events occurring at, and involving functions within, the neuromuscular, respiratory, phonatory, or articulatory mechanisms” (Shapiro, 2011).

Table 1 outlines the steps of EBP as proposed by Law (2002) and used as the methodological framework for Bulgarian research projects conducted between 2009 and 2019 at the SWU Stuttering Research Center.

Table 1

Steps Toward Evidence-Based SLP Practice as Accepted in the USA and Canada

Step 1	The SLP formulates a specific question about the treatment method to be used in caring for a person who stutters
Step 2	The SLP finds the available published evidence, as available from: ASHA's National Center for Treatment Effectiveness in Communication Disorders Treatment Efficacy Bibliographies Combined Health Information Database ERIC Ingenta PubMed Cochrane Oxford Library (UK) Research Navigator The Dome Evidence-Based Practice Centers (USA and Canada) Journal of Speech and Hearing Research (JSHR) special issue series 1996–1998 Journal of Fluency Disorders (2003) special issue on EBP in stuttering
Step 3	The SLP evaluates the quality of the evidence obtained at step 2
Step 4	The SLP makes a reasonable decision about what approach/method to use in caring about the patient with stuttering disorder, based in large part on the evidence identified at step 3
Step 5	The SLP evaluates the impacts and outcomes of the care provided to the client

Table 2 outlines the four “levels of evidence” as advanced by the Agency for Healthcare Research and Quality (AHRQ) of the USA's Department of Health and Human Services. In Bulgaria, as well as

in the USA and Canada, the application of the evidence grading system to stuttering is divided into the main categories of developmental stuttering in children and stuttering in adults.

Table 2
Levels of Evidence Used to Assess the Strength of Research Findings

Level of evidence	Research Study Design
Level 1	Randomised controlled trials
Level 2	Nonrandomised controlled trials
Level 3	Observational studies with controls
Level 4	Observational studies without controls

The use of systematic reviews and meta-analyses is crucial to the five steps of EBP, especially given the wide range of methodologies employed across the profession of the SLP, even within stuttering. The research challenge in Bulgaria largely centres on the ability to select the appropriate methodology for the correct assessment and treatment. Similar to other health specialties, the variability between individuals with fluency disorders guarantees that the process of selecting an appropriate research methodology will not be straightforward. The variety of arguments regarding what constitutes valid and reliable research and what may serve as trustworthy evidence only adds to the complexity (Lowis, Harrison, & Wiland, 2019; O'Connor & Pettigrew, 2009). Especially in Bulgaria, the area of stuttering disorder, within the profession of the SLP is in his infancy with regard to research evidence. In general, issues surrounding levels of evidence and the application of evidence to clinical decision making are problematic for Bulgarian logopedists who received their training before or during the recent professional shift from a special education subspecialty to a health profession specialty as represented by speech-language pathology (SLP).

5. Discussion

Refining the results with the search term “stuttering” limited to the timeframe of 1980–2015 resulted in 13 systematic reviews and meta-analyses. ASHA and others have recommended employing six or more meta-analyses to support a scientific evidence base for clinical practice, particularly for AWS (Baxter et al., 2016; Franic, & Bothe, 2008; Herder, Howard, Nye, & Vanryckeghem, 2006; Pertijs et al., 2014).

There is also controversy as to which measurements are the most useful and reliable in practice.

Bothe, Davidow, Bramlett, and Ingham (2006) reviewed 162 articles resulting in 197 units of analysis, as some articles contained comparisons and, therefore, analyses of more than one treatment. Of these, 39 met the required four out of five trial-quality criteria for inclusion as research based. All of them measured *stuttering frequency* as well as social, emotional, or cognitive (SEC) measures. The maintenance of reduced stuttering or improvement on SEC measures *at least 6 months post-treatment* was analysed by the author.

The different methods for measurement of the stuttering treatment outcomes in children and adults are recommended to be used as effectiveness instruments: Stuttering, S-24 (Andrews & Cutler, 1974); The Stuttering Self-Rating of Reactions to Speech Situations (Darley and Spriesterbach, 1978); The A-19 Scale for Children who Stutter (Guitar and Grimes, 1977); The Stuttering Severity Instrument SSI-4 (elaborated by Riley, 2009); The Kiddy CAT Communication Attitude Test Pre-school-kindergarten (Vanryckeghem & Bruten, 2007); The Wright and Ayer Stuttering Self-Rating Profile (WASSP, Ayre & Wright, 2009; Wright & Ayre, 2000), and The Overall Assessment of the Speaker’s Experience of Stuttering (OASES, Yaruss & Quesal, 2004).

The treatment of persons who stutter has been a subject of discussion for many years in the field of communication sciences and disorders. According to the Law (2007) the data retrieved from 1788 articles (of which only 19 met the inclusion criteria) show that there is no single treatment approach for stuttering. In Bulgaria, the USA, and Canada, the fluency shaping approach has been commonly preferred for both children and adults who stutter. One of the reasons for application is the fact that all

fluency shaping programs measure changes in the level of stuttering.

Empirical investigations of treatment for AWS have focused primarily on the fluency shaping and stuttering modification approaches. *Fluency shaping* is aimed at speech restructuring by introducing new and modified speech patterns and reinforcing fluency (e.g. Howie & Woods, 1982; Onslow, Costa, Andrews, Harrison, & Packman, 1996; Onslow, Menzies, & Packman, 2001; Packman, Onslow, & van Doorn, 1994). Conversely, *stuttering modification* addresses not only managing fluency, but also the impact of stuttering on the individual, as well as the negative perceptions and feelings associated with stuttering (e.g. Blomgren et al., 2005; Yaruss, 2001; Yaruss, Coleman, & Hammer, 2006). Nonetheless, efficacy data on these treatment approaches remains limited (Bothe et al., 2006).

Although there is a long history of the stuttering modification approach in the USA and Canada, it has only been recently applied in Bulgarian clinical research practice and outcomes data after 3-year intensive treatment (IT) have been reported (Georgieva, 2014). Van Riper's non-avoidance approach (intensive group therapy) was applied in Bulgaria (2010-2014) with fifteen AWS between 22 and 28 years of age (mean = 25.2 years). They were enrolled in a 5-day IT program with a stabilisation phase after 9 months of IT. Follow-up data regarding the overall effect were collected over a 3-year period. The duration of disfluencies (DDs) in seconds and the index of disfluences (ID) were measured. Data showed positive results and significant reduction of DDs immediately following and 3 years after the IT ($p < .184$). The overall effect indicates significant fluency changes ($p < .001$) of ID after IT and after 3 years (Georgieva, 2015a; Georgieva, 2015b; Georgieva, Simonska, Stoilova, 2019, p. 253). The results represent only the initial step in evaluating the outcomes obtained by intensive group therapy for AWS in Bulgaria.

To meet international standards, an evidence-based integrated therapy model for stuttering therapy was instituted. A meta-analysis of stuttering publications indicated that the Lidcombe program program was among the most effective treatment methods (Onslow, Packman, & Harrison, 2003; Block, Onslow, Packman, Gray, Dacakis, 2005). The Lidcombe program accordingly was applied

for early stuttering treatment in Bulgaria between 2010 and 2014. Sixteen children who stutter between the ages of 2 to 7 years (3:1 male/female ratio) were selected in for study. Measurement procedures consisted of the disfluency index (DI) and the number of syllables stuttered per minute (SSm). No significant difference regarding correlation of intervention progress and stuttering severity was found ($p > 0.05$). Nonetheless, the results showed a significant difference between initial and final part the Stage 1 regarding the DI and SSm ($p < 0.001$). A significant difference between initial part of the study and three years after the therapy was found ($p < 0.001$), (Georgieva, Simonska, & Stoilova, 2019, p. 254). In conclusion, the results suggest that by implementing Lidcombe program positive results can be obtained early in stuttering treatment.

An overview of SMAs indicate that prolonged speech and gentle onset are the most effective techniques in short and long terms periods than either attitude or airflow techniques (Andrews, Guitar, & Howie, 1980). Georgieva and her colleagues (Georgieva, Stoilova, & Tcholakova, 2016; Georgieva & Stoilova, 2018; Georgieva, Simonska, & Stoilova, 2019) also studied the application of the La Trobe prolonged speech program between 2015 and 2018 for ten males and two female AWS (ages 18 to 29; mean = 22.4 years). Percent stuttered syllables (%SS) and naturalness (NA) were measured. The percentage SS reduction tendency was maintained also 1 day before the IT and 36 months after the IT: monologue outside clinic ($Z = 3.069; p < 0.01$), conversation outside clinic ($Z = 3.064; p < 0.01$) telephone-home ($Z = 3.063; p < 0.01$), and conversation-home ($Z = 3.063; p < 0.01$). The mean NA score was 6 at pre-treatment, 1.58 immediately after the IT, and 2.4 36 months after the IT. The Friedman analysis ($p = 0.024$) showed significant changes ($p < 0.05$). The Wilcoxon signed rank test results also indicated the same trend 36 months after the IT ($p < 0.011$), (Georgieva, Simonska, & Stoilova, 2019, p. 254-255). They concluded that, by implementing La Trobe prolonged speech program, positive results were obtained immediately and 3 years after the stuttering treatment.

In Bulgaria as well as in Canada and the USA, the assessment of lifestyle needs took place in the context of the WHO ICF model (2001) developed for

stuttering by Yaruss and Quesal (2004, 2006). This internationally recognised model was a general framework for the cited studies above and was providing the impetus for identifying activities and social roles appropriate for individuals with stuttering as a main goal of therapy process.

6. Conclusion

The professional bodies that govern clinical practice in the Bulgarian health fields are not currently guided by EBP concepts. There are no established guidelines based on existing SLP practice which, in itself, is not well documented. Further, the term *logopedist* (or *speech-language pathologist*) is not a protected title in Bulgaria and there is no regulation of clinical practice. There is no evidence-based framework for the prevention, diagnosis, and treatment of stuttering as there is in the USA and Canada, which follow the revised guidelines for initial education in speech-language pathologies established by the International Association of Logopedics and Phoniatrics (IALP; Cheng, 2010). In Bulgaria there is a positive accumulated experience in some state universities because the IALP guidelines provide relevant information on the education and training of SLPs. The illustrative framework states that students should receive training in fluency disorders (stuttering). Following the research-based teaching model at university level, the Master's degree curriculum in SLP has been revised to include a new course in 2015, EBP in SLP.

There is no doubt that the application of EBP in SLP in Bulgaria will increase the quality of the scientific and experimental research on stuttering; will provide the necessary additional high-tech equipment for appropriate research; will offer high-quality assessment and therapy for clients with a stuttering disorder on a national level, and will improve the quality of life of the clients with severe fluency disorders and provide them with an appropriate social integration. The creation of new clinical pathways for persons with fluency disorders outside of non hospital clinics is a real and ongoing challenge for Bulgarian practitioners.

EBP stands as a fundamental way to promote changes appropriate for a health profession, and can be applied to: (i) students training in SLP at the university level; (ii) conduct of high-quality research studies; and (iii) be an effective clinical ap-

plication of evidence-based assessment and treatment regarding different aged groups of clients with a stuttering disorder.

Conflicts of interests

Authors declare no conflict of interests.

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