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An Exploratory Study Of Jordanian Resource-Room Teachers' Knowledge About Stuttering

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Abstract

The study examines the overall knowledge of stuttering of 106 Jordanian resource-room teachers, and whether or not their knowledge is affected by the variables of academic qualification and years of experience. To achieve the objectives of the study, the Alabama Stuttering Knowledge Test (ASK; Crowe & Cooper, 1977), which consists of 26 yes/no questions, was used to assess teacher knowledge about stuttering. The findings reveal that the extent of the participants' knowledge about stuttering is low, and that there are statistically significant differences in the extent of the participants' knowledge which can be attributed to academic qualification and years of experience, in favor of holders of graduate degrees and participants with over five years of experience. The findings have given rise to several recommendations and pedagogical implications.

Keywords: awareness; Childhood-Onset Fluency Disorder; resource rooms; special education teachers; stuttering

Background and Significance of the Study

Communication is a process during which ideas, emotions and experiences are exchanged (Justice, 2006). Among people, language, spoken or written, is the primary means of communication through which ideas, opinions, views, and emotions are exchanged with others (e.g., Rosario, 2001).

Language is a verbal behavior which is nurtured through the child's interaction with the input generated in his/her surroundings (Eisenberg, Cumberland, & Spinrad, 1998; Krashen & Terrell, 1983; Kuhl, 2004; Lightbown & Spada, 2013; Tucker, 2003). Most children seem to acquire fluent control of language almost effortlessly (Brown, 2000; Lightbown & Spada, 1993; O'Grady, Archibald, Arnoff, & Rees-Miller, 2005), as they unconsciously learn their native language (or languages) through abstracting and internalizing structural information from the language spoken around them (Campbell & Wales, 1970).

Acquiring language is essentially a sign that the child is learning to be a member of his/her community. Most children can use language easily by age five. However, some children may have trouble with certain utterances (viz., sounds, words, sentences). Language acts as a tool to regulate emotions (e.g., Cole, Armstrong, & Pemberton, 2010) and, thus, language disorders may impair the child's ability to use language to regulate his/her emotions (Curtis, Kaiser, Estabrook, & Roberts, 2019).

Research suggests that language disorders are not at all uncommon. Tomblin, Zhang, Buckwalter, and Catts (2000), for instance, report that up to just over 19 percent of all toddlers experience delayed language development, and up to eight percent of pre-school children have a developmental language disorder. Research (e.g., Curtis, Frey, Watson, Hampton, & Roberts, 2018) further suggests that children, especially older children, with language disorders are more prone to problem behaviors than their typically developing peers.

Communication disorders may affect how children talk, understand, analyze, or process information. Simply put, a communication disorder, which manifests itself in the processes of hearing, language, and/or speech, is an impairment in one's ability to receive, send, process, and comprehend concepts or verbal, nonverbal and graphic symbols (American Speech-Language-Hearing Association (ASHA), 1993). A communication disorder is also defined as a neurodevelopmental disorder characterized by impairments in sending, receiving, processing, or comprehending verbal, nonverbal, or graphic language, speech, and/or communication (Zachik, Popivker, Vasa, & Landa, 2017).

According to the American Speech-Language-Hearing Association (ASHA, 2021), a spoken (or oral) language disorder is a significant impairment in the acquisition and use of language due to deficits in comprehension and/or production across any of the language domains of phonology, morphology, syntax, semantics, and pragmatics.

More specific to this research, stuttering, also known as child-onset fluency disorder, stammering, and disfluent speech, is a disruption in the fluency of verbal expression characterized by involuntary, audible or silent, repetitions or prolongations of sounds or syllables (ASHA, 2021). Johnson, Boehmler, Dahlstrom, Darley, Goodstein, Kools, Neely, Prather, Sherman, Thurman, Trotter, Williams, and Young (1959) identified eight signs of stuttering: interjections (including filled pauses), word repetitions, phrase repetitions, part-word repetitions, prolongations, broken words, incomplete phrases (or abandonments), and revisions.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), communication disorders are classified into five major types: language disorder, speech sound disorder, child-onset fluency disorder (stuttering), social (pragmatic) communication disorder, and Speech unspecified communication disorder (American Psychiatric Association, 2013). A language disorder is characterized by difficulties in the acquisition and use of language across the various modalities, which brings about symptoms like reduced vocabulary, limited sentence structure, and inferior language abilities whereas a speech sound disorder is characterized by difficulties in speech sound production which causes speech intelligibility and poor verbal communication.

Most relevant to the scope of this research, speech childhood-onset fluency disorder (stuttering) is characterized by flaws in the fluency and time patterning of speech leading to symptoms such as repetition of sounds, syllables, and words, prolongation of consonants and vowels, and pausing within words (APA, 2013; Birstein, 2015; Kraft, Lowther, & Beilby, 2019) whereas a speech social (pragmatic) communication disorder is characterized by flaws in the social use of verbal and non-verbal communication (e.g., difficulty in the acquisition and use of spoken and written language, inappropriate responses in conversation). However, a speech unspecified communication disorder is characterized by symptoms which impede social, occupational, educational, and interpersonal functioning yet are insufficient to warrant a more specific diagnosis.

Language communication disorders, also known as language or speech disorders (ASHA, 1993), are the second most recurring problem facing children. A speech disorder, also known as an oral or spoken language disorder, is a significant temporary or permanent impairment in language acquisition and use attributed to deficits in comprehension and/or production across any of the language domains of phonology, morphology, syntax, semantics, and pragmatics. A speech disorder is considered a specific language impairment when not accompanied by an intellectual disability, global developmental delay, hearing or other sensory impairment, motor dysfunction, or other mental disorder or medical condition (ASHA, 2021).

Written language disorders, which are beyond the scope of this exploratory research, are

significant impairments in word recognition (i.e., decoding, sight-word recognition), reading comprehension, spelling, or written expression (Ehri, 2000; Tunmer & Chapman, 2007; 2012). Like speech disorders, written disorders can involve awareness, comprehension, and production of language across phonology, morphology, syntax, semantics, and pragmatics (Nelson, Plante, Helm-Estabrooks, & Hotz, 2015). The literature (e.g., Scott & Windsor, 2000) suggests a positive relationship between speech and written disorders, as children with spoken language problems are more likely to have difficulty in learning to read and write and vice versa.

Stuttering is a developmental fluency disorder which appears in childhood before the age of six (Guitar, 2013; Hedge, 2010). According to Perkins (1990, p. 376), stuttering is an involuntary disruption of a continuing attempt to produce a spoken utterance. Stuttering is also defined as a defect in the fluency and motor fluency of speech, which includes repeating sounds or syllables, prolongation of sounds, interruptions in words, and pauses, accompanied by apparent bodily movements (American Psychiatric Association, 2013). Similarly, Conture (1990) defined stuttering as a disorder in the natural fluency of speech, which appears in childhood, and is characterized by repetitions and audible prolongations, or involuntary silence in sentences, semi-sentences, words, syllables, or sounds alone.

The extensive clinical and empirical research, which has been conducted to delineate the nature and causes of stuttering (Guitar, 2013), suggests that persistent stuttering may cause lifelong problems in communication and social participation, as approximately one percent of all children and adolescents, 0.2 percent of women, and 0.8 percent of men suffer from stuttering worldwide (Bloodstein & Bernstein Ratner, 2008; Craig & Tran, 2005; Neumann, Euler, Bosshardt, Cook, Sandrieser, & Sommer, 2017).

This may be worsened as children begin school, when they start comparing the way they speak with that of their peers, which may lead not only to feelings of inadequacy, anxiety, shame, confusion, and psychological maladaptation but also to emotional and behavioral problems, poor confidence and self-concept, frustration, shyness, withdrawal from social interactions, avoidance of verbal encounters and individuals for fear of ridicule and criticism (Nippold & Packman, 2012). Thus, the stuttering child may be forced to engage in avoidance and/or non-adaptive behaviors, which potentially inhibits participation in day-to-day activities (Klompas & Ross, 2004; Yaruss, 2010), interaction with peers, speaking out in class and, eventually, affects academic achievement (O'Brian, Jones, Packman, Menzies, & Onslow, 2011; Williams, Melrose, & Woods, 1969).

Identifying the cause(s) of stuttering, which is the most common of all language disorders, poses a significant challenge professionals and workers alike, yet the exact causes of stuttering remain obscure (Yaruss & Quesal, 2006). Stuttering is believed to be linked to genetics (Drayna & Kang, 2011; Felsenfeld, 1997; Kang, 2015; Packman & Attanasio, 2004), which may play an important role in the likelihood of an individual's susceptibility to stuttering.

In the same context, twin and family studies (e.g., Suresh, Ambrose, Roe, Pluzhnikov, Wittke-Thompson, Ng, Wu, Cook, Lundstrom, Garsten, Ezrati, Yairi, & Cox, 2006) seem to suggest a strong relationship between genetics and stuttering, backed by findings that stuttering is more common among first-degree relatives (Wittke-Thompson, Ambrose, Yairi, Roe, Cook, Ober, & Cox, 2007). In some cases, predisposition to stuttering may be caused by brain damage, a syndrome that may be brought about by a stroke, traumatic brain injury, or other neurologic events in early childhood. The behavior of parents (e.g., anxiety, insecurity, self-centeredness, excessive cruelty, high expectations), especially mothers, may also bring about stuttering in children (Voulgari, 2012).

Research also suggests that boys are more susceptible to stuttering than girls (Drayna, Kilshaw, & Kelly, 1999) whereas other research (e.g., Nippold & Rudzinski, 1995) seems to suggest that parental communication patterns are another potential cause for stuttering. However, it is worth noting that the average intelligence of stuttering individuals does not differ from that of non-stuttering individuals (Bloodstein & Bernstein Ratner, 2008), not to mention that 90 percent of stuttering children recover during childhood and a decrease of

incidence to less than one percent is reported for adulthood (Yairi & Ambrose, 2013).

Beilby (2014) maintains that stuttering is often coupled with behavioral and social difficulties, self-awareness, and reactions to stuttering. Not only did she overview stuttering across an individual's childhood and adolescence and describe the adverse effect of stuttering on the child and his/her parents and siblings, Beilby further examined and reported on the effectiveness of a treatment program which encourages psychological flexibility through self-concept, diffusion, acceptance, mindfulness, values, and committed action. The model was found to expand behavioral choices, reduce emotional reactivity, and improve quality of life for stuttering individuals.

There are two types of stuttering: developmental and neurogenic. Developmental stuttering, which is the most common form of stuttering, occurs in young children still learning speech and language skills, as the child's speech and language abilities are inadequate for meeting his/her verbal demands. Research has shown that genetic factors contribute to developmental stuttering which is also believed to run in families. On the other hand, neurogenic stuttering may occur after a stroke, head trauma, or another type of brain injury, as the brain may have difficulty coordinating speaking functions (ASHA, 2021).

These researchers believe that, regardless of the variety of causes, symptoms, and types of stuttering, evidence-based interventions are needed to enable stuttering children to overcome the ensuing psychological, academic, and social problems described elsewhere in this manuscript. However, despite scientific breakthroughs in the knowledge about stuttering, no reliable, research-backed cure has been found (NSA, 2021), but there are several treatment options, which differ depending on individual factors (e.g., age, communication goals) to better enable individuals to control their speech fluency, develop effective communication, and fully engage in school, work and social activities (Mayo Clinic, 2021). Most notable amongst those are speech therapy, electronic devices, cognitive behavioral therapy, parent-child interaction, and still-unproven medication (Mayo Clinic, 2021; National Institute on Deafness and Other Communication Disorders (NIDCD, 2016b).

Research suggests that the beliefs, knowledge, and awareness of stuttering varies from one community to the other, which has a strong bearing on the provision of stuttering-related services and legislations. Similarly, parents' involvement in, acceptance of, and attitudes towards stuttering are catalysts for children's development of coping and effective communication skills which foster independence and self-esteem. It is imperative to examine parents' attitudes towards stuttering, as these may foster or hinder intervention and treatment through the provision, or lack thereof, of support to enable the child to overcome, or at least limit, his/her communicative problems and reduce the likelihood of detracting from their quality of life (Safwat & Sheikhany, 2014a; 2014b).

People, irrespective of their age, education, culture, and occupations, tend to stereotypically view stuttering individuals as more reserved, withdrawn, introverted, fearful, anxious, tense, and more afraid to speak than people who do not stutter, which often affects how these individuals are treated in the community. Therefore, targeting and correcting incorrect stereotypes is of paramount importance to avoid adverse psychological, social, and academic repercussions on stuttering individuals (DeBritto Pereira, Rossi, & Van Borsel, 2008).

An unprecedented global attention has been given to stuttering, as, every year since 1998, the stuttering community celebrates International Stuttering Awareness Day on the twenty-second of October. On this day, people who have an interest in stuttering, speech-language pathologists, and parents of stuttering children all over the world raise awareness of and correct misconceptions about stuttering through public awareness events, media campaigns, and educational activities (NSA, 2021).

Since stuttering is evident across world communities and cultures (DeBritto Pereira et al., 2008), a plethora of research has addressed the knowledge about, awareness of, and attitudes towards stuttering and people who stutter, most of which revealed that the general public adopt biased, stigmatizing, or discriminatory views about these individuals (Klein & Hood, 2004). However, relatively little research on stuttering and individuals who stutter has been done across the Arab region (Abdalla, Irani, & Hughes, 2014; Abdalla & St.

Louis, 2012; Safwat & Sheikhany, 2014a; 2014b). This part of the study reviews relevant research to determine the level of knowledge of stuttering in various geographical areas.

Abdalla and St. Louis (2012) examined the knowledge of and attitudes towards stuttering and coping strategies used by 471 in-service and pre-service public school teachers in Kuwait using an Arabicized version of the Public Opinion Survey of Human Attributes-Stuttering. The findings revealed that even though the respondents were familiar with stuttering,
most were misinformed about its causes and he ld stereotypical views about people who stutter (compared to the findings of previous research). Marginal differences were found between pre-service and in-service teachers' knowledge of stuttering.

In a related study, Abdalla, Irani, and Hughes (2014) investigated 943 university students and adults' attitudes towards stuttering and people who stutter in Kuwait. The findings revealed that the attitudes towards stuttering and people who stutter are generally positive, with a few negative trends relating to the perceived causes and traits of stuttering and the potential vocational /societal inclusion of people who stutter.

Hobbs (2012) examined 23 primary- and secondary-stage teachers' knowledge of and attitudes towards stuttering before and after an in-service training program in Kentucky, U.S.A. The findings revealed statistically significant differences in the teachers' overall knowledge of stuttering after joining the training program. The findings also revealed a statistically significant relationship between teachers' knowledge of and attitudes towards stuttering.

Homidi (2012) examined the knowledge of stuttering of 346 teachers of grades 1-6 in Saudi Arabia per the variables of experience, age, qualification, prior interaction with students with stuttering, and stuttering-related training. The findings revealed that the subjects exhibit a good knowledge of stuttering. Homidi also reported significant differences which can be attributed to gender (in favor of male teachers), to previous interaction with stutterers, and to receiving stuttering-related training. No statistically significant differences were attributed to either age or teaching experience.

Shollenbarger, Terry and Akbari (2017) interviewed 180 college students to assess their basic knowledge of the causes and symptoms of stuttering. The findings revealed that the subjects do not have adequate knowledge about the causes or symptoms of stuttering, but they reportedly would like to know more.

Panico, Daniels, Hughes, Smith, and Zelenak (2018) compared the perceptions of 224 student- and practicing- teachers about students with stuttering, who were surveyed about their knowledge of stuttering, perceptions about stuttering students, and beliefs about classroom participation and accommodations for stuttering students. The findings revealed that both student- and practicing teachers exhibit limited knowledge of stuttering and need for developing their knowledge of how to best accommodate stuttering students in their classrooms.

Al-Qaisi, Ali, and Khudhair (2020) examined 370 Iraqi primary school teachers' knowledge of stuttering school-age children (using ASK) and whether their knowledge is affected by teacher age, residence, marital status, qualification, and years of teaching experience. The findings revealed that the majority of the subjects (about 54%) have poor knowledge of stuttering, and that their knowledge is not affected by any of the variables under study.

Grigoropoulos (2020) examined 73 Greek early-grade teachers' knowledge of and attitudes towards stuttering, using the Alabama stuttering scale (Crowe & Cooper, 1977) and the Attitudes Towards Stuttering Scale (Crowe & Walton, 1981). The findings revealed that the teachers' knowledge was good (above average relative to the scores obtained by the original scale), that their attitudes towards stuttering children are positive, and that there is a positive relationship between teachers' knowledge of stuttering and their attitudes towards adult stuttering children.

Problem, Purpose, and Questions of the Study

Research on language communication disorders, especially that which seeks to measure special education teachers' knowledge about these disorders in general and stuttering in particular, is scarce albeit crucial for providing teachers with information about the nature, causes, and evidence-based solutions to

the problems arising from communication disorders.

To the best of these researchers' knowledge, little information is available on public awareness, especially among Jordanian special education teachers, of communication disorders in general and stuttering in particular. A review of the local literature indicates that stuttering has not received the attention afforded to other communication disorders. This dearth of information on the types, symptoms, causes, diagnosis, and treatment of stuttering may negatively affect treatment and successful interventions.

Even though the researchers expect that the level of Jordanian special education teachers' knowledge about stuttering would be comparable to that of other teachers as gleaned from the research conducted outside Jordan, this research is hoped to offer further insights from a population that bear distinct social and cultural differences from those addressed in international research.

Therefore, the purpose of the current study is to determine the extent of Jordanian resource-room teachers' knowledge about stuttering to gain better understanding of the awareness of this disorder and put forth recommendations for improving teacher (and care-taker) competence, skills, and strategies through the provision of appropriate knowledge and training to improve their skills and experiences, which would ultimately catalyze the child's learning and behavior.

More specifically, the study attempts to answer the following questions:

1. How knowledgeable are Jordanian resource-room teachers aware of stuttering?
2. Are there statistically significant differences (at $\alpha = 0.05$) between the mean scores of Jordanian resource-room teachers' scores on the knowledge of stuttering test, which can be attributed to academic qualification and teaching experience?

Significance of the Study

Being one of the few to examine the extent of resource-room teachers' knowledge of stuttering, this study may contribute to the findings already reported in the literature by localizing the research to Jordan and gleaning conclusions that may be peculiar to the Jordanian special education context in terms of the causes, characteristics, spread, and treatment of stuttering, especially with the dearth of local research on teachers' knowledge of stuttering, the prevalent misconceptions about it, the teachers' need for capacity-building opportunities on how to deal with stuttering children, coordination with experts and other stakeholders to design and implement appropriate training programs for the provision of stuttering-related knowledge and skills, and organizing nation-wide awareness-raising campaigns of stuttering in Jordan.

Operational Definitions

Stuttering, also known as childhood-onset fluency disorder, is a disruption to speech fluency (Kraft et al., 2019) characterized by repetitions and verbal prolongations, or involuntary pauses in sentences, clauses, words, syllables, or individual sounds (Conture, 1990) but is not attributable to a medical condition or developmental or mental disorder (Birstein, 2015). In this study, the teacher's knowledge of stuttering is measured by the teachers' respective scores on the knowledge of stuttering test used in the research.

Resource-room teachers, also known as special education teachers, are teachers who instruct and assist students who suffer from mental, physical, emotional, or learning disabilities. They may work in special-education or inclusive classrooms. As such, resource room teachers work closely with mainstream teachers, parents, and administrators to insure proper instruction and monitor student progress. In this study, resource room teachers are those who work at the learning resource rooms in the public schools in Irbid (Jordan) in the academic year 2020/2021.

Teacher's knowledge of stuttering is represented by the resource-room teacher's score on the Alabama Stuttering Knowledge Test.

Method and Procedures

This research uses a descriptive survey design to objectively assess the phenomenon under study. The teachers' knowledge of stuttering is investigated using a test especially designed for

this purpose and characterized by the necessary psychometric properties.

Subjects of the Study

The subjects of the study are a purposefully-selected sample of 106 special education teachers working in the learning resource rooms in Irbid (Jordan) in the academic year 2020/2021. The participants are distributed according to academic qualification and teaching experience, as shown in Table 1.

Table 1. Sample Distribution according to Academic Qualification and Teaching Experience

Qualification	Teaching Experience (in Years)				Overall	
	Five years or less		More than five years		n	%
	n	%	n	%		
Undergraduate	**23**	**21.7**	**19**	**17.9**	**42**	**39.6**
Post-Graduate	**36**	**34.0**	**28**	**26.4**	**64**	**60.4**
Overall	**59**	**55.7**	**47**	**44.3**	**106**	**100**

Instrument of the Study

The researchers adopted the Alabama Stuttering Knowledge Test (ASK) developed by Crowe and Cooper (1977). The test consists of 26 yes/no items which measure overall knowledge of stuttering. The researchers translated ASK into Arabic. The rigor of the translation process was assured by asking two bilingual specialists in language communication disorders to translate the English version into Arabic under specific instructions not only to be faithful to the meaning but also to the structure of the items as much as possible.

Upon completion of the translation into Arabic, two other bilingual specialists in language communication disorders back translated the test into English. As an additional quality assurance measure, the back-translation into English was refereed by an expert jury of three professors who established the validity of the translation.

To insure the content validity of the test itself, the Arabic version was reviewed by a jury of professors of special education, language communication disorders, and learning difficulties in Jordanian universities. The jury's feedback, which was limited to the wording of a few items, was used towards producing the final draft of the test. Similarly, the construct validity of the test was established through a pilot study of 27 teachers, who were excluded from the sample of the research. The corrected item-total correlation coefficient was calculated for each of the test items, as shown in Table 2.

Table 2. Corrected Item-Total Correlation of Teachers' Knowledge of Stuttering

Item No.	Corrected Item-Total Correlation	Item No.	Corrected Item-Total Correlation
1	0.47	14	0.43
2	0.53	15	0.32
3	0.33	16	0.32
4	0.34	17	0.53
5	0.34	18	0.55
6	0.42	19	0.42
7	0.33	20	0.40
8	0.51	21	0.31
9	0.30	22	0.36
10	0.47	23	0.46
11	0.53	24	0.52
12	0.44	25	0.42
13	0.38	26	0.30

Table 2 shows that values of the corrected item-total correlation coefficient are all greater than 0.20, which is appropriate for the purpose of the study.

The reliability of the test was established by piloting it to a sample of 27 teachers from the population but outside the sample of the study. The internal consistency coefficient, calculated

using Cronbach's alpha equation for the test as a whole, amounted to 0.93 which is deemed appropriate for the purpose of this research.

Each of the 26 yes/no items of the test was allocated one point, and the score range was between zero and 26 (converted into percentages to facilitate comparisons). The cut-off scores used to determine the level of knowledge of stuttering were used as follows:

Score/100	Level of Knowledge
Less than 60	Low
60-79	Moderate
80-100	High

Variables of the Study

In this study the independent variables comprised academic qualification (viz., undergraduate, postgraduate) and teaching experience (viz., up to five years, over five years). On the other hand, the dependent variable is the level of the teachers' knowledge of stuttering, as represented by the mean scores of the participants' responses to the 26 items of ASK.

Statistical Analyses

To answer the first research question, which addresses the teachers' knowledge of stuttering, means and standard deviations of the participants' responses to ASK were calculated. Similarly, means and standard deviations of the participants' responses to ASK were also calculated to answer the second research question, which examines potential differences which may be attributed to academic qualification and teaching experience. To determine the potential statistical significance of the observed difference, sought in the third research question, two-way analysis of variance (ANOVA) was used.

Findings and Discussion

The findings related to the first research question, which seeks to determine resource-room teachers' knowledge of stuttering as measured by the participants' responses to ASK, revealed a mean score of 15.16 (or 58.31%) and a standard deviation of 3.55. This indicates a low level of teachers' knowledge of stuttering, which may be attributed to potential confusion of stuttering with other communication or language disorders.

This result may be also attributed to that the teachers' knowledge of stuttering is essentially gained from general courses at the university or from documentaries and awareness-raising media programs. Specialized tertiary-level courses on language communication disorders in general and stuttering in particular in special education and counselling programs are essentially non-existent in Jordanian universities (at which the participants had received their training). This is further compounded by the fact that diagnosing and treating stuttering require accurate specialized and practical training beyond the theoretical knowledge usually gained in tertiary-level special education and counselling courses.

The current findings are consistent with those of a plethora of previous research (e.g., Abdalla & St. Louis, 2012; Meteab Al-Qaisi et al., 2020; Panico et al., 2018; Shollenbarger et al., 2017). For example, the current findings are consistent with those of Abdalla and St. Louis (2012) who reported a general weakness in pre- and in-service teachers' knowledge about the causes of stuttering and stereotypical perceptions of stuttering persons in Kuwait; Meteab Al-Qaisi et al. (2020), who revealed a weakness in first grade teachers' of stuttering in Iraq; and Shollenbarger et al. (2017), who reported that college students' knowledge of the causes of stuttering is insufficient.

Nevertheless, these findings are inconsistent with those of some previous research (c.f., Grigoropoulos, 2020; Homidi, 2014). More specifically, both Homidi (2014) and Grigoropoulos (2020) reported that early grade teachers in Saudi Arabia and Greece, respectively, manifested a good level of knowledge of stuttering.

Therefore, improved knowledge is a requisite for being able to differentiate between stuttering and other disorders, particularly as to the nature, symptoms, types, causes of stuttering, the psychological, personal, and behavioral attributes of stutterers, and stuttering-related statistics locally, regionally, and globally.

The second research question sought potential statistical significance (at $\alpha = 0.05$) between the mean scores of teachers' knowledge of stuttering according to academic qualification and teaching experience. To answer this question, means and standard deviations of the teachers' responses to ASK were calculated

against qualification and experience, as shown in Table 3.

Table 3. Means and Standard Deviations of the Participants' Responses to ASK according to Qualification and Experience

Qualification	Teaching Experience (in Years)				Overall	
	Five years or less		More than five years		Mean	SD
	Mean	SD	Mean	SD		
Undergraduate	**14.13**	**2.87**	**14.42**	**3.22**	**14.26**	**3.00**
Post-Graduate	**14.42**	**2.59**	**17.46**	**4.38**	**15.75**	**3.78**
Overall	**14.31**	**2.68**	**16.23**	**4.20**	**15.16**	**3.55**

Table 3 shows observed differences in the mean scores of the participants' responses to ASK. To determine whether or not these differences are statistically significant, two-way analysis of variance was used, as shown in Table 4.

Table 4. Two-Way ANOVA of the Participants' Responses to ASK according to Qualification and Experience

	Sum of Squares	df	Square Means	f	Sig.
Qualification	**69.456**	**1**	**69.456**	**6.320***	**0.014**
Experience	**69.823**	**1**	**69.823**	**6.353***	**0.013**
Qualification x Experience	**47.625**	**1**	**47.625**	**4.334***	**0.040**
Error	**1120.955**	**102**	**10.990**		
Adjusted Total	**1324.274**	**105**	**16.23**	**4.20**	

* statistically significant at α=0.05

Table 4 shows statistically significant differences in the teacher's knowledge of stuttering, which can be readily attributed to academic qualification. It seems that a positive relationship exists between knowledge of stuttering and qualification in favor of teachers with postgraduate degrees. In other words, the findings seem to suggest that the higher the teacher qualification, the greater his/her knowledge of stuttering.

Similarly, experience seems to be positively correlated with knowledge of stuttering. Table 4 above reveals a statistically significant difference in teachers' knowledge of stuttering, which can be attributed to experience. Table 4 above also shows the difference is in favor of the teachers with more experience (> five years).

Table 4 also reveals statistically significant differences in teachers' knowledge of stuttering which may be brought about by the interaction between the variables of qualification and experience. To determine in whose favor these differences are, the figures were graphed, as shown in Figure 1

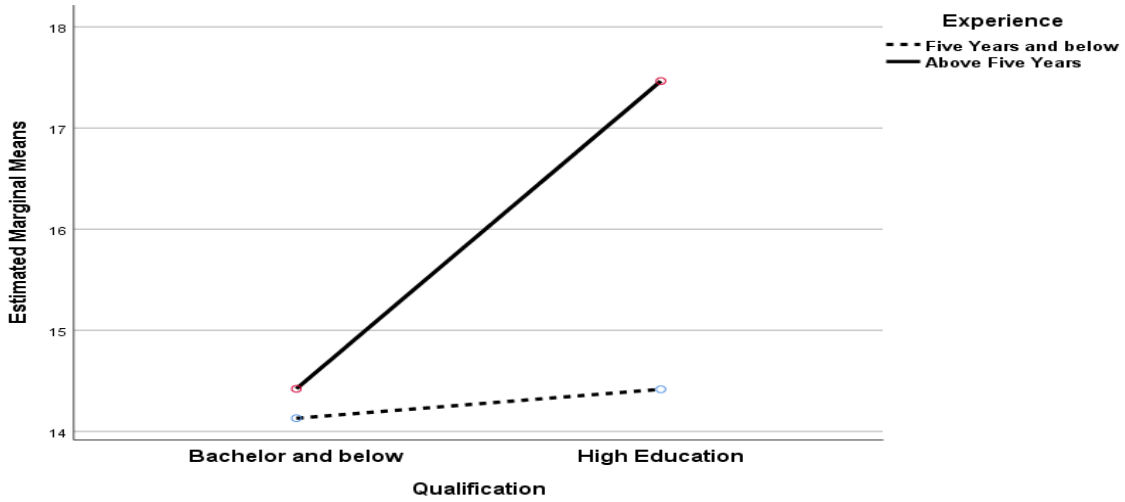

Figure 1. Means of the Participants' Responses to ASK according to Qualification and Experience per the Interaction between Qualification and Experience

Figure 1 shows that teachers with a postgraduate degree and over five years of experience are relatively more knowledgeable about stuttering than their counterparts. This result seems to make much sense, as more experience and higher academic qualification may serve as catalysts for both stuttering-related knowledge and skill.

Conclusions, Implications, and Recommendations

Even though speech and writing are distinct processes (e.g., Chafe & Tannen, 1987), the relationship between them is backed by empirical evidence (e.g., ASHA, 2021; Catts, Fey, Zhang, & Tomblin,1999; Hulme & Snowling, 2013). Reading and writing are essentially interdependent. Speech difficulty often leads to reading and writing difficulty which, inversely, often signals speech difficulty (Scott & Windsor, 2000).

As communication is a requisite to learning, the child's ability to communicate actively with peers and teachers is critical for both learning and social development in- and outside the school setting and, ultimately, instrumental for successful growth and socialization which is essential for his/her success in school and later in life. For early primary-school children, the language (and communication) skills they have acquired through oral communication (viz., listening and speaking) constitute the foundation for written communication.

Scholars all over the world are exploring better identification of the causes and treatment of stuttering (NIDCD, 2016a). For example, researchers are studying whether volunteer people who stutter can learn to recognize, with the help of a computer program, specific speech patterns associated with stuttering to avoid using them when speaking. There are also much research reports on experiments involving electronic devices, pharmaceuticals, and other still-unproven techniques and alternative treatments for stuttering (NSA, 2021).

In light of the findings, it is recommended that workshops and training courses be made available to resource-room teachers to raise their awareness language communication disorders in general and stuttering in particular. It is further recommended that more research be conducted on the potential effectiveness of existing programs for treating language communication disorders in Jordan. More research is also needed on stuttering, the most vulnerable age and social groups, chances of recovery, and other areas, on which empirical evidence is rather limited.

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