

Resilience Training & Parental Support for Children Who Stutter - A Systematic Review

by  
Rachel Davis

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Approved by

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Advisor: Dr. Gregory Snyder

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Reader: Dr. Myriam Kornisch

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*Hyejin Park*

Reader: Dr. Hyejin Park

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## ABSTRACT

The objective of this study was to investigate the relationship between emotional resilience and family/parental/caregiver support for children who stutter, and to review existing research on resilience training and family support relative to enhancing the quality of life in children who stutter. Thus, *A systematic review of appropriate published studies was conducted utilizing the electronic databases PubMed and Google Scholar.* Analysis revealed that there is an abundance of research supporting parental support and resilience training; however, there was limited direct clinical application relative to the unification of these concepts. Data indicates that the clinical application of emotional resilience and cognitive behavior therapy, along with parental/family/caregiver support have significant potential in increasing the quality of life for children who stutter. Additional research needs to be conducted focusing on unifying resilience and parental support strategies within direct clinical application, such as a parent-led resilience training program.

Keywords: stuttering, children, resilience, parental support

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## TABLE OF ACRONYMS

<b>PWS</b>	Person Who Stutters/ People Who Stutter
<b>PWDS</b>	Person Who Does Not Stutter/People Who Do Not Stutter
<b>CWS</b>	Child Who Stutters
<b>AWS</b>	Adults Who Stutter
<b>QoL</b>	Quality of Life
<b>PMC</b>	Partially Met Inclusion Criteria
<b>MAC</b>	Met All Inclusion Criteria
<b>PCIT</b>	Parent-Child Interaction Therapy
<b>SES</b>	Socioeconomic Status
<b>LAQ</b>	Lifestyle Appraisal Questionnaire
<b>SOS</b>	Significant Others Scale
<b>%SS</b>	Percentage of Stuttered Syllables
<b>SR</b>	Stuttering Severity Rate
<b>PAFAS</b>	Parenting and Family Adjustment Scales
<b>SDQ</b>	The Strengths and Difficulties Questionnaire
<b>CECSRS</b>	The Curtin Early Childhood Stuttering Resilience Program
<b>OASES</b>	Overall Assessment of the Speaker's Experience of Stuttering
<b>SSI-4</b>	Stuttering Severity Instrument for Adults and Children
<b>RCI</b>	The Reliable Change Index

## 1.0 INTRODUCTION

### *1.1 Stuttering*

Stuttering is generally considered to be a speech disorder that emerges between two and four years of age, affects approximately 1% (or 55 million) of the global population, and is characterized by overt characteristics (repetitions, prolongations, and inaudible postural fixations during speech production), as well as covert characteristics (escape, avoidance behaviors, etc.) (Bloodstein et al., 2021). Approximately 5% of children exhibit some form of stuttered behaviors during early development (Yairi & Ambrose, 2005). Moreover, stuttering has also been found to exist in other forms of communication such as penmanship, sign language, and musical expression (Snyder, 2006). While a clear etiology of stuttering has yet to be determined, the most substantial recent evidence suggests that stuttering is a chronic neurological disorder involving genetic mutations (Han et al., 2019; Kang et al., 2010; Raza et al., 2015; Yairi & Ambrose, 2005) rather than a psychological disorder, as once was commonly believed.

### *1.2 Stuttering Consequences*

Research indicates that there are many misconceptions and stereotypes regarding people who stutter (PWS), thus indicating that stuttering is a misunderstood disorder. Over the years, studies examining the public view of stuttering have identified generally unfavorable perceptions, ascribing labels such as *anxious*, *shy*, *nervous*, *unassertive* or *introverted* to the stuttering community (Abdalla & St. Louis, 2012; Betz et al., 2008;



Klassen, 2001). Despite the lack of data that supports these stereotypes, the public view of stuttering has revolved around this perception, and their prevalence may result in a loss of opportunity for PWS. Studies indicate that such negative stereotypes for PWS have been demonstrated in the workforce and educational settings (Dorsey & Guenther, 2000; Hurst & Cooper, 1983). For example, in a study of 232 PWS, ages 18 and up, 70% believe that stuttering decreases their chances of employment and promotion (Klein & Hood, 2004). For children who stutter (CWS), research indicates that they may face additional difficulty involving themselves in social and emotional situations than their fluent peers. Additionally, research suggests that pre-school CWS are typically less inclined to engage in play or assume leadership roles over children who don't stutter (CWDS) (Walden & Lesner, 2018). Furthermore, because of these common misconceptions, this can foster a sense of unworthiness to the stuttering community and ultimately lead to a decrease in social interactions, self-worth, etc. (Snyder et al., 2020). Consequently, stuttering could negatively impact the quality of life (QofL) to some degree in CWS (Beilby et al., 2012; Klompas & Ross, 2004).

### *1.3 Components of Quality of Life*

Previous research shows that there are many different definitions of one's QofL, and that it is dependent on subjective variables such as family life, working life, social life, leisure time, etc. (Craig et al., 2011). QofL is a term that includes both one's satisfaction with life and well-being. Satisfaction of life is only judged by the individual themselves, and one's satisfaction levels directly correlate with their QofL (Plexico et al., 2019). Researchers also address the fact that just because someone may stutter, that doesn't necessarily mean they automatically have a poor QofL (Klompas & Ross, 2004;

Plexico et al., 2019). Ultimately, it comes down to how resilient the individual is. One study addressed the QoFL in PWS and discovered that the relationship between one's QoFL and stuttering severity is ultimately dependent on the individual's coping style. Thus, it comes down to how resilient the individual is (Koedoot et al., 2011). Relative to this study, *QoFL is defined as an individual's subjective experiences of life as a CWS.*

#### *1.4 Resilience*

Mainstream stuttering therapy does not typically address the concept of emotional resilience training in CWS. Although there is a wide variety of research regarding the concept of resilience, limited research has been done in the realm of resilience training in CWS. However, Caughter and Crofts (2018) discovered that targeted therapy with CWS can increase their ability to become more resilient. In general, resilience takes on a broad definition and is defined in various ways. It is a complex adaptive system that has the capacity to adapt successfully to challenges thrown one's way (Masten & Barnes, 2018). Other definitions describe resilience as a multifaceted construct that is the ability to "bounce back" when faced with adversity (Caughter & Crofts, 2018). Relative to stuttering, resilience could be a key component in children's overall ability to increase their QoFL. While the concept of resilience is a broad term with multiple applications (Caughter & Dunsmuir, 2017; Craig et al., 2011; Druker, Mazzucchelli, Beilby (2019), relative to this study, resilience is defined as *the ability to successfully adapt to unknown circumstances, whether innate or trained.* (Caughter & Crofts, 2018; Pearson & Kordich Hall, 2006; Masten & Barnes, 2018). Studies have shown that having a resilient personality can help individuals balance the hardships that life brings. Hardiness and self-enhancement are two factors linked to resilience and have been shown to increase

confidence and self-esteem (Bonanno, 2004). Researchers studied the overall QofL between PWS and people who don't stutter (PWDS) and compared the levels of resilience between these individuals. Results concluded that PWS had lower levels of resilience and were more likely to have an overall lower QofL than PWDS (Plexico et al., 2019). Furthermore, it was suggested that two comparable PWS can have entirely different life experiences relative to their level of personal resilience such as their reactions, behaviors, attitudes, and beliefs about themselves. (Plexico et al., 2019). Therefore, it is imperative that therapists, parents, and individuals spend time addressing the concept of resilience and how it could potentially improve CWS overall QofL through resiliency training. For example, when hardships occur, they may be able to respond in a healthier way.

### *1.5 Family Support*

Another key component in enhancing CWS QofL that should be further explored is promoting resilience through family/parental/caregiver support. A major component of nurturing resilience in CWS is through their relationships with supportive adults (Caughter & Crofts, 2018). Research suggests that developing resilience through adult support can be completed through a four-step process known as “**R**eaching **I**n to face life’s challenges and **R**eaching **O**ut to others and opportunities that encourage healthy development” (RIRO). RIRO is a Canadian based program designed to build resilience in children up to 8 years of age (Pearson & Kordich Hall, 2006). First, adults must learn to foster resilience in themselves. Secondly, they need to create a learning environment which provides opportunities for the child to learn resilience. Next, they are required to facilitate and model such behaviors in the child’s environment through day-to-day

experiences. Lastly, they then need to continue to develop resilience as children practice their newly acquired skills following RIRO. The concept of fostering a sense of resilience to children through caregivers is not a new one. A former studied concluded, that children who have a close bond with an emotionally stable adult (teacher, parent, grandparent, etc.), tend to be more resilient and better equipped to handle the hardships that life brings (Werner, E. E., 1995). Additionally, Reivich and Shatté, (2002) provide research that suggests that one's thinking patterns are not fixed. Thus, we learn to become resilient by changing our thinking process. Relative to this study, your caregiver is a key component in fostering resilience. Therefore, if resilience is the ability to successfully adapt to unknown circumstances, whether innate or trained, then caregivers are the ideal candidate in fostering resilience training for CWS (Pearson & Kordich Hall, 2006).

### *1.6 Purpose of Study*

While parents/caregivers are the ideal candidates for fostering resilience training in CWS, as they typically spend the most time with their children, research suggests that resiliency skills can also be taught in therapeutic sessions (Craig et al., 2011; Pearson & Kordich Hall, 2006). While there is extensive research on resilience within the psychological domain, these skills are not prevalent within conventional stuttering treatment for CWS. As such, there is limited data relative to the effects of resilience training and family support on the CWS's QofL. Since genetic data suggests that stuttering is a chronic neurological disease (Raza et al., 2015) and may be resistant to conventional stuttering treatment (Guntupalli et al., 2006), therapeutic supplements (e.g., resilience training), targeting the improvement of QofL are warranted (Yaruss, 2010). Therefore, it is hypothesized that the concept of emotional resilience training (i.e.,

mindfulness, cognitive behavioral therapy, etc.) and family/parental/ caregiver support could be two key components in unlocking a new paradigm of stuttering treatment. The objective of this study was (1) to investigate the relationship between emotional resilience and family/parental/caregiver support for CWS, and (2) to review existing research on resilience training and family support relative to enhancing the QoL in CWS.

## **2.0 METHODS**

### *2.1 Databases*

A systematic review was conducted according to the recommendations via the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA). A combination of previously published studies was assessed, utilizing the electronic databases PubMed and Google Scholar. A similar study was conducted using the same inclusion by another researcher in order to avoid selection bias and crosscheck articles in this realm study.

### *2.2 Keywords & Inclusion Criteria*

A systematic computerized search was conducted starting January of 2022. The search was primarily conducted via PubMed and sequentially Google Scholar. Relative to PubMed, substantial efforts were made to optimize the keywords using a Boolean search. Once optimal keywords were identified within the PubMed database, those keywords were then utilized in the Google Scholar database to provide additional results. Inclusion criteria utilized within the PubMed and Google Scholar databases included but were not limited to the following terms: resilience, children, stuttering, and parenting.

### *2.3 PubMed Data Extraction*

Relative to PubMed, a Boolean search was used to optimize results (Herskovic et al., 2007). In retrieving results from a large database, such as PubMed, it is necessary that

the researcher utilizes a precise choice of words incorporating the terms AND, OR, and NOT (Aliyu, 2017), which is referred to as the Boolean search process. Initially, numerous keywords were tested using the following search terms: “children or child or adolescent on aids for pediatric” AND “resilience or resilience training or mindfulness” AND “invisible disorders or stuttering or stammering or speech” and “stuttering or invisible disorder or speech disorders or stammering” AND “children or kids or adolescents or child” AND “resilience or resilience training or mindfulness or mindful” AND “family involvement or parent or mother or father”. Following this search algorithm yielded a variety of publications. However, after pilot testing various keywords alongside the Boolean operation system the most successful search terms included the following process: First, searching terms “stuttering or stammering or stutter or stammer,” then, AND “resilience or training or mindfulness,” then, AND child or children or kids or adolescents”, and finally AND “family or support or social or parents or parenting.” Lastly, using the feature “advanced search” all 4 searches were added together and included the following “NOTS:” “NOT covid-19 or crime or screening.” Following this specific algorithm provided a small selection of results that seemed most valuable. Only information relating to children, stuttering, resilience, or family/parental/caregiver support was extracted.

### *2.3 Google Scholar Data Extraction*

Since Google Scholar uses an artificial intelligence-based algorithm, a fundamentally different process was used to leverage results. While Google Scholar is one of the top search engines used, there is little known about their ranking algorithm (Beel & Gipp, 2009). After establishing the most common key concepts from the

publications retrieved from PubMed, the following key terms were used for Google Scholar: “resilience children parenting stuttering.” Only information relating to children, stuttering, resilience, or family/parental/caregiver support was extracted.



## 3.0 RESULTS

### *3.1 PubMed*

After the completion of the literature search via PubMed results were analyzed and sorted. Out of 145 potentially relevant articles (15 pages), 131 were eliminated based on the fact that the title made it evident that the article would not be useful in conducting research in this realm of study. Accordingly, the 14 remaining articles were fully retrieved for review. These 14 articles included at least 1 of the 4 inclusion criteria. Therefore, the 14 articles discussed at least a minimum of one key topic, including “resilience, parent/caregiver involvement, children, and stuttering.” Out of the 14 studies that met at least 1 of the 4 inclusion criteria, 4 were found to include all of the inclusion criteria (i.e. discusses CWS and the role of parent/caregiver support to enhance resilience.) A comprehensive review was conducted on the 14 articles retrieved from PubMed. These articles were separated into 2 broad categories—articles that Partially Met the Inclusion Criteria (PMC), and articles that Met all Inclusion Criteria (MAC). In total, 10 articles were included within the PMC category, (i.e., these studies included at least 1 of the 4 inclusion criteria), and 4 articles were included within the MAC category, (i.e., included all of the inclusion criteria). After further investigation, the findings and key themes were extracted from each article. Relative to the 10 PMC articles, 6/10 key themes focused on the impact of family/parental/caregiver support for PWS, 1/10 key themes focused on a type of resilience training, and 3/10 PMC were found to be not

directly applicable (NA) after a more extensive review was completed. Although these 3 last mentioned articles did discuss parts of the inclusion criteria, they were not relevant to the current systematic review. It should be noted that each article that fell under the PMC category contained inclusion criteria relevant to stuttering. Refer to Figure A-1 and A-2 in the Appendices for a visual reference of the breakdown process for the eligible studies from PubMed and for a chart of Key Themes for the 10 PMC articles.

### *3.2. PMC: Parental Support + Stuttering*

As stated above, 60% of the studies focused on the concept of parental/caregiver support. Caregiver interaction was found to play a significant role in working with CWS. In a recent study conducted by Shafiei et al. (2019), findings indicate that parent interaction was found to be beneficial relative to therapeutic outcomes. They examined various programs such as The Lidcombe Program and the Parent-Child Interaction Therapy (PCIT). These programs were found to be successful in reducing stuttering severity, and overt stuttering frequency. However, the concept of resilience was not thoroughly explored as a potential therapy option in treating CWS, and, thus, was excluded on the basis of inclusion criteria. Another recent study conducted by Sawyer et al. (2017), indicated that parent-child interaction is an additional important factor in therapy options. The primary goals of this study targeted children's cognition, linguistic, motor, and emotional state. Using principles based on the strategies of the PCIT and Lidcombe program, caregivers tried reducing their articulation rate when speaking to CWS as part of the therapy. This study lacks the concept of incorporating resilience as a beneficial therapeutic option. In another study, findings indicate that, when working with

CWS, clinicians should conduct a comprehensive evaluation and explore individualized treatment options such as the Van Riper technique, easy starts, changing tension, desensitization, & pseudo stuttering (Zebrowski & Cilek, 1997). The relation between parental involvement and classroom teachers are discussed as an additional important factor in incorporating therapy options for CWS. This study did not meet all the inclusion criteria based on the fact that resilience was not thoroughly explored as a treatment option. Richels et al. (2013) compared CWS and CWDS vocab and language skills based on parental involvement and socioeconomic status (SES). Results found that maternal education greatly contributed to the increase in vocabulary and language skills for children. This article highlights the importance of family involvement as a key component in working with CWS. While this study focuses on the SES of parents and explores other ideas not necessarily relevant to our study, this study is worth exploring because it provides evidence in support of incorporating family involvement. The absence of resilience serves as reasons for exclusion criteria. Namasivayam et al. (2018) study lacks the concept of resilience as a crucial therapy option, but does highlight the importance of parental involvement in working with CWS. Lastly, Guttormsen et al. (2020) highlights the importance of parental involvement as a key factor to incorporate in working with CWS. The goal of this study was to measure caregiver's perceptions about whether they understand the impact they have on their children. Reasons for exclusion include the absence of the concept of resilience. While the studies discussed may differ in purpose, procedure, participants, etc. one thing remains constant, caregiver interaction/parental support is a key factor in working with CWS. Children need support from those they are around the most. Parental support is one component of creating

effective therapeutic options for CWS. As a result, parents are responsible for creating a resilient rich environment for their children and model behaviors, attitudes, mindfulness, etc.

### *3.3 PMC: Resilience Training + Stuttering*

Only 10% of the studies focused heavily on the concept of resilience. The aim of the study conducted by Craig et al. (2011) was to investigate factors that could contribute to adults who stutter (AWS), and their ability to become resilient when dealing with fluency disorders. In total, 200 AWS participated in this study, and they were initially categorized as resilient or non-resilient based on their global psychology scores. Each participant completed a number of measures such as the Symptom Checklist—Revised (SCL-90–R), Connor-Davidson Resilience Scale, GSI global measure of distress, Lifestyle Appraisal Questionnaire (LAQ), Medical Outcomes Study Short Form-36, and Significant Others Scale (SOS) to measure resilience, self-efficacy, QoL, health risk, social support, hardiness, etc. Results indicated that the resilient group had higher levels of protective factors, lower health risks, higher self-efficacy over stress, fewer physical role limitations, higher social functioning, vitality, and social support compared to the non-resilient group. While this study was conducted on AWS, rather than CWS, it does highlight the importance of resilience therapy in working PWS. It also provides substantial research on measuring resilience. In lieu of the results measuring self-efficacy, social support, and social functioning, data suggest these 3 factors could play a large role in enhancing resilience. This study is important to examine because it provides evidence supporting the concept of resilience training as a key factor in protecting PWS.

### *3.4 PMC: Not Directly Applicable*

Initially, 3 studies were retrieved to review and partially met the inclusion criteria, however, they were later labeled as not directly relevant to this study on the basis of: small participant size (1 participant), explored different treatment options (such as behaviorally based motor speech treatment options or prolonged speech), or measured outcomes (not about QofL). The following studies include: Eichorn & Pirutinsky, (2021), Beita-Ell & Boyle,(2020), and Marcotte (2018). Refer to Table A-1 in the Appendices for a table of the PMC articles, their findings, reasons for exclusions, and key themes.

### *3.5 PubMed: 4 studies that met all inclusion criteria (MAC)*

In total, 4 articles were found to meet all the inclusion criteria (i.e., resilience, parental support, children, and stuttering). These 4 articles were analyzed and categorized into 2 separate groups. The first group contained articles by Yaruss (2010) and Gottwald & Hall (2003). The second group contained articles by Druker, Mazzucchelli, & Beilby (2019), as well as Caughter and Dunsmuir (2017). While all four articles met the entirety of the inclusion criteria, each group had different key themes. After further review, group 1 key themes were found to significantly reflect the importance of support systems for CWS (whether that be parent led, clinician led, teachers, etc.). In contrast, group 2 key themes highlighted resilience training programs for CWS. Details of each category are further discussed below.

### *3.6 MAC: Group 1: Discussed Resilience*

Group 1 includes studies by Yaruss (2010) and Gottwald & Hall (2003). While both studies meet all the inclusion criteria, research excelled in the clinical application of support systems (whether that be clinician, parent, teacher support, etc.) compared to the absence of clinically relevant resilience training. In the study conducted by Yaruss

(2010), the authors advocate for individualized comprehensive evaluation of the client along with enhanced desensitization, and a variety of treatment strategies (Van Riper techniques, easy starts, enhancing fluency, etc.). While desensitization is one component of resilience, resilience is more complex than desensitization alone. Yaruss (2010) states that “The goal is to encourage clinicians to develop a better understanding of how stuttering can adversely affect school-aged children, how these adverse effects can be documented so children can be qualified for treatment, and, ultimately, how the consequences of stuttering can be minimized through a comprehensive approach to treatment.” In the study conducted by Gottwald & Hall (2003), the authors focus on the importance of developing relationships with client/clinician & family/teachers’ relationships. Similar to that of the Yaruss (2010) study, this article highlights the importance of resilience, but neither conducts any sort of resilience training into a therapeutic option for CWS.

### *3.7 MAC: Group 2: Targeted & Quantified Resilience*

Group 2 included two studies by Druker, Mazzucchelli, & Beilby (2019) and Caughter and Dunsmuir (2017). In the study conducted by Druker et al. (2019), the procedure included 2 groups of participants, CWS with and without a parent led resilience component. The measures included a stuttering severity pre- and post-test, *The Parenting and Family Adjustment Scales* (PAFAS) pre-and post-test (Sanders et al., 2014). Additionally, other assessments helped measure resilience such as the *The Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997), *Child Behaviour Questionnaire* (CBQ; Rothbart et al., 2001), and *The Curtin Early Childhood Stuttering Resilience Program* (CECSRS; Druker et al., 2019) The CECSRS was a homemade

resilience training program constructed by Drunker and his colleagues. The structure of this program was based on the GRIT scale, which is a valid scale that measures the resilience in children (Duckworth & Quinn, 2009). It included a 12-week program with 30-minute training sessions. The first 3 weeks were spent training the parents and the additional 9 weeks the parents were asked to apply resilience principles in activities at home. Clinicians were actively involved in each training session. Results showed that stuttering severity decreased in both groups. However, the group that received the additional resilience training showed improved resilience scores based on pre/post testing. This article is highly beneficial because it not only addresses the concepts of resilience, children, stuttering, and parental support, but also it provides a parent-led resilience training program. Caughter and Dunsmuir (2017) published data featuring a child-parent therapy program measuring the effects of resilience training using the *Overall Assessment of the Speaker's Experience of Stuttering-School Aged* (OASES-S; Yarrus and Quesal, 2006), *Resiliency Scales for children and adolescent's* questionnaire (Prince-Embury, 2006), and *Stuttering Severity Instrument for adults and children* (SSI-4; Riley, 2009). *The Reliable Change Index (RCI)* was used to ensure results from the resiliency scales, OASES-S, and SSI-4 were reliable (RCI; Jacobson & Truax, 1991). In addition, children took place in interviews 9 months post-therapy. Results concluded that using the RCI and OASES-S scores on the resilience questionnaire demonstrated improvement. Furthermore, data suggest adopting an integrated approach (highlighting resilience) in therapy for CWS as cognitive/emotional change, as well as a positive therapeutic environment were key drivers to facilitate change and build resilience. Refer

to Table A-2 in the Appendices for a table of the MAC articles, their findings, reasons for inclusion and key themes.

### *3.8 Google Scholar Rationale*

Since Google Scholar uses an artificial intelligence built into the search algorithm, a different approach was leveraged to maximize results. Beel & Gipp (2009) set out to reverse engineer Google Scholar's search algorithm. They found that one of the most important factors in fully optimizing Google Scholar is by checking the "cited by" feature. Higher cited articles are found to rank higher than less cited articles. As stated above, using the keywords: resilience and children and parenting and stuttering through Google Scholar yielded approximately 10,000 results. This yielded a much larger range of results versus PubMed. 8 articles were included that met some sort of inclusion criteria (children, stuttering, resilience, and parental involvement). The search ceased when 20 consecutive articles were not applicable to the inclusion criteria. Since previous research has found that articles citation count holds a significant impact on Google Scholar rank, the "cited by" and "related articles" feature was checked to ensure other paradigms in this realm of study were not missed. Table A-3 includes citations of additional articles found in the "cited by" and "related articles" feature from the 8 relevant articles that met the inclusion criteria. Refer to Figure A-3 in the Appendices for a visual reference of the Google Scholar breakdown process of eligible studies.

### *3.9 Google Scholar Results*

As predicted by Beel & Gipp (2009) numerous replicated articles are revealed when reviewing the "cited by" and "related articles" feature. Additionally, many of the same authors were replicated. This reiterates the limited scope of the stuttering resilience



research paradigm. Checking additional “cited” and “related” articles ensures other articles in this realm of study were not excluded. Top results included many of the same authors and exact articles that were pulled from PubMed, detailed below.

Druker, Mazzucchelli, & Beilby (2019) “*An Evaluation of an Integrated Fluency and Resilience Program for Early Developmental Stuttering Disorders,*” was listed as a top result on Google Scholar. This article was found to meet the entirety of the inclusion criteria following the previous PubMed systematic review. This validates the key words used hold a lot of merit when exploring this topic. Similarly, another top article that met all inclusion criteria following the PubMed search that was also listed as a top result on Google Scholar was “*An exploration of the mechanisms of change following an integrated group intervention for stuttering, as perceived by school-aged children who stutter (CWS)*” by Caughter and Dunsmuir (2017). Both articles discuss the importance of implementing a parent-led resilience training program into therapy for CWS.

Additionally, *Nurturing a Resilient Mindset in School-Aged Children Who Stutter* by Caughter and Crofts (2018) was a top result on Google Scholar, consisting of the same author of a similar article that MAC through PubMed. Not by surprise, this journal article suggests parents are key to creating a resilience-rich environment and modeling a resilient mindset into CWS. Additional articles found through Google Scholar worth exploring on the basis of the abstract making it evident it holds some sort of inclusion criteria are articles by authors: Kelman & Wheeler (2015); Harley (2018); Druker, Mazzucchelli, Hennessey, & Beilby (2019); Druker, Mazzucchelli, Hennessey, & Beilby (2020), and Rodgers, Berquez, Hollister, & Zebrowski (2020).

Results coincide with Beel & Gipp (2009) study in that Google Scholar ranking matters. The 8 articles found useful in this realm of study were listed on pages 1 through 4, thus serving as higher rank than the 20 for 20 studies that were not applicable to this study found on pages 5 and higher. There seems to be a sort of echo chamber regarding the numerous replicated articles relative to this study are in the “cited by” and “related” feature. Results support that Google Scholar does indeed use a ranking algorithm based on highly cited articles. While Google Scholar does use a different algorithm than other search engines, it’s not necessarily good or bad. The authors suggest that Google Scholar could potentially be more suitable when searching for standard literature, and that perhaps less suitable for “papers whose authors are advancing views opposite to the mainstream;” (i.e., resilience training program for CWS.) The limited amount of results that the inclusion criteria compared to the very high number of yielded results support this claim. Refer to Table A-3 in the Appendices for the articles found in the Google Scholar search and their ‘cited by’ and “related articles.”

## 4.0 DISCUSSION

Both PubMed and Google Scholar included relevant articles in this realm of study. One search engine did not seem to outperform another. As previously discussed, these medical databases apply completely different algorithms that must be utilized in different forms to maximize results. Duplicate articles and authors were found in both search processes ensuring that the target was hit in this realm of study. Thus, informing the researcher that there is a paucity of studies related to this paradigm.

Parental support is a common theme within speech and language treatment (Zebrowski & Cilek, 1997; Sawyer et al., 2017; Richels et al., 2013; Namasivayam et al., 2018), as well as pediatric stuttering treatment (Yaruss, 2010; Gottwald & Hall, 2003). Parental involvement in pediatric stuttering treatment is most prominently associated with the Lidcombe Program, which focuses on the benefits of including parental involvement in home therapy as a means of fostering spontaneous recovery (Shafiei et al., 2019). The Lidcombe Program is designed to foster spontaneous recovery from stuttering, and thus does not focus on emotional intelligence or resilience. However, once the child is believed to have moved from incipient stuttering to persistent stuttering, then shifting parental involvement from overt stuttering severity to resilience and emotional intelligence is warranted (Yaruss, 2010; Gottwald & Hall, 2003).

While there are active lines of pediatric stuttering research on parental support, and of resilience relative to QofL, this systematic review indicates there are few studies discussing the clinical synergy of family led resilience training, and even fewer studies

that clinically implement parent-led resilience training programs designed for CWS. The only articles clinically implementing parent-led resilience training programs include (Druker, Mazzuccheli, & Beilby, 2019), (Caughter & Dunsmuir, 2017) and (Caughter & Crofts, 2018). Druker et al.(2019) selected 31 CWS to participate in a parent-administered resilience training program. The procedure included 2 groups of participants, CWS with and without a parent-led resilience component. The children received therapy over a 12-week period using a variety of tests to measure resilience as previously discussed. The targeted age group included CWS between the ages of 3-6. While the merits of early intervention is no longer debated, it is also likely that a majority within this age-range may spontaneously recover regardless of intervention. Additionally, Caughter & Crofts (2018) highlight the importance of parental involvement as a means of creating a resilient-rich environment alongside the RIRO Program and Penn Resiliency Program. Similar to that of the study mentioned above, RIRO is designed for children up to 8 years of age. The Penn Program uses Cognitive Behavioral Therapy (CBT) practices and is designed for young adolescents between the ages of 10-15. While little was discussed about the Penn Program, we do know it is based on CBT practices, which could serve more beneficial for the older age group being targeted. Similarly, Caughter & Dunsmuir (2017) targeted CWS ages 10-14 using parent-led resilience training therapy emphasizing CBT practices over the course of a year. CBT therapy is a psychological treatment approach commonly used with adults and lends itself to adolescents who stutter.

An underlying theme in this systematic review is the limited research leveraging parental involvement and resilience training in children or teens who stutter. Historically,

neither parental involvement, nor resilience training, was featured in conventional stuttering therapy. However, the Lidcombe Program mainstreamed parental involvement within (incipient stage) pediatric stuttering treatment, and the concept of resilience training is becoming more popular for children with persistent stuttering. As a result, a trend may be emerging relative to discussing parent-led resilience training programs for children and adolescents who stutter, and most recently the clinical implementation of parent-led resilience training programs for children and teens who stutter.

## **5.0 LIMITATIONS**

Google Scholar does not share their proprietary search algorithms publicly. Additionally, it periodically updates its algorithms and does not publicly state when the algorithm was changed or how it was changed. For instance, Google Scholar sometimes replaced certain articles when typing in the same keywords. While the advanced Boolean search option is a helpful tool in searching for publications via PubMed, it is only as effective as the keywords utilized by the researcher. Since this is a rather new paradigm being explored, finding the exact keywords to plug in to maximize results can be challenging. Lastly, incorporating additional search engines could help maximize results for this systematic review.

## **6.0 FUTURE RESEARCH**

In conclusion, more research needs to be conducted that focuses on combining resilience and parental support into direct clinical application (resilience training program). There is a strong agreement among researchers that calls for future research to be directed towards resilience training therapy, parental support, and CWS. Therefore, there should be a dedicated effort to develop a reliable training program for CWS, leveraging both parental support (optimal, but if available) and clinician support as a means of providing better treatment options for the stuttering community. Additionally, when working with CWS, it's crucial to consider the targeted age range. Research suggests that when working with young adolescents, CBT practices could potentially be of value. The results of this study suggests further investigation is warranted in this realm of study.

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## APPENDICES

**Table A-1. 10 PMC Articles: Findings, Reasons for Exclusions, and Key Themes**

Title, Author, Publication Year	Findings	Reasons for exclusion	Key Themes
1. Effects of the Lidcombe Program and Parent-Child Interaction Therapy on Stuttering Reduction in Preschool Children (Shafiei et al., 2019)	The Lidcombe Program, parent-child interaction therapy (PCIT), is successful in reducing the percentage of stuttered syllables (%SS), and stuttering severity rate (SR).	Absence of concept of resilience	Parental involvement/Support
2. Stuttering Therapy in the Elementary School Setting: Guidelines for Clinician-Teacher Collaboration (Zebrowski & Cilek, 1997)	For best results in working with CWS, clinicians should conduct a comprehensive evaluation and explore a variety of treatment options, alongside parent-teacher interaction.	Absence of concept of resilience	Parental Involvement/Support
3.The Effects of Parent-Focused Slow Relaxed Speech Intervention on Articulation Rate, Response Time Latency, and Fluency in Preschool Children Who Stutter (Sawyer et al., 2017)	Caregivers can alter their speech rate, which in turn can increase CWS fluency.	Absence of concept of resilience	Parental Involvement/Support
4.Evidence, Goals, and Outcomes in Stuttering Treatment: Applications With an Adolescent Who Stutters (Marcotte, 2018)	Adolescent clients would be likely to benefit from a treatment program based on prolonged speech.	Absence of concept of resilience and parental support	NA
5.School-Based Speech-Language Pathologists' Perceived Self-Efficacy in Conducting Multidimensional Treatment With Children Who Stutter (Beita-Ell & Boyle, 2020)	Additional research is suggested to train SLP's to feel a higher sense of self-efficacy when working with CWS.	Absence of concept of resilience and parental support	NA

<p>6. Resilience and Stuttering: Factors That Protect People From the Adversity of Chronic Stuttering (Craig et al., 2011)</p>	<p>The resilient group had higher levels of protective factors, lower health risks, higher self-efficacy over stress, fewer physical role limitations, higher social functioning, vitality, and social support compared to the non-resilient group.</p>	<p>Absence of children and parental support</p>	<p>Resilience</p>
<p>7. Cognitive Flexibility and Effortful Control in School-Age Children With and Without Stuttering Disorders (Eichorn &amp; Pirutinsky, 2021)</p>	<p>Stuttering is related to attention control and flexibility beyond the preschool years. Evidence suggests that CWS are less able to regulate emotions than CWDS and less able to control attention. (Karrass et al., 2006).</p>	<p>Absence of concept of resilience and parental support</p>	<p>NA</p>
<p>8. Socioeconomic status, parental education, vocabulary and language skills of children who stutter (Richels et al., 2013)</p>	<p>Higher education of parents and higher SES runs parallel to kids who have expanded vocab and language skills, especially material education.</p>	<p>Absence of concept of resilience</p>	<p>Parental Involvement/ Support</p>
<p>9. Parent-child interaction in motor speech therapy (Namasivayam et al., 2018)</p>	<p>The Parent-Child Interaction Observation scale (PCIO) is reliable and parent skills improved over time through training, support, and monitoring in working with CWS.</p>	<p>Absence of concept of resilience</p>	<p>Parental Involvement/ Support</p>
<p>10. Caregivers' perceptions of stuttering impact in young children: Agreement in mothers', fathers' and teachers' ratings (Guttormsen et al., 2020)</p>	<p>Involving numerous caregivers can aid an integrated assessment in working with CWS. Overall, caregivers are in agreement that they are the main source of information about a child's well-being.</p>	<p>Absence of concept of resilience</p>	<p>Parental Involvement/ Support</p>

**Table A-2. 4 MAC Articles: Findings, Reasons for Inclusions, and Key Themes**

Title, Author, Publication Year	Findings	Reasons for inclusion	Key Themes:
1.Evaluating and Treating School-Aged Children Who Stutter (Yaruss, 2010)	Calls for an individualized comprehensive evaluation of the client and integrating a variety of treatment strategies such as (Van Riper techniques, easy starts, enhancing fluency, etc.), as well as enhancing desensitization.	Resilience CWS Parental Support	Parental Involvement/ Support
2.Stuttering Treatment in Schools: Developing Family and Teacher Partnerships (Gottwald & Hall, 2003)	Focuses on the importance of developing relationships with client/clinician & family/ teachers relations.	CWS Relationships Resilience	Parental Involvement/ Support
3.An Evaluation of an Integrated Fluency and Resilience Program for Early Developmental Stuttering Disorders (Druker et al., 2019)	Implementation of a resilience training component was successful in increasing resilience in PWS.	CWS Resilience training Relationships	Resilience Training
4.An exploration of the mechanisms of change following an integrated group intervention for stuttering, as perceived by school-aged children who stutter (CWS) (Caughter & Dunsmuir, 2017)	Data suggest adopting an integrated approach, such as Cognitive Behavioral Therapy (CBT),in therapy for CWS to increase resiliency.	CWS Resilience training Relationships	Resilience Training



**Table A-3.** Google Scholar: Rank, Cited By and Related Articles

Title, Authors/Year	Google Scholar Page Rank	Cited by	Related articles
1.An evaluation of an integrated fluency and resilience program for early developmental stuttering disorders (Druker et al., 2019)	1	<p><b>* Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2020).</b></p> <p>Pinto, T. M., Laurence, P. G., Macedo, C. R., &amp; Macedo, E. C. (2021).</p>	<p><b>*Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2020).</b></p> <p><b>*Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2019).</b></p> <p>Shafiei, B., Faramarzi, S., Abedi, A., Dehqan, A., &amp; Scherer, R. C. (2019).</p>
2.Nurturing a Resilient Mindset in School-Aged Children Who Stutter (Caughter & Crofts, 2018)	1	<p><b>*Freud, D., &amp; Amir, O. (2020)</b></p> <p><b>*Abendroth, K. J., &amp; Whited, J. E. (2021)</b></p>	<p><b>*Abendroth, K. J., &amp; Whited, J. E. (2021)</b></p> <p><b>*Caughter, S., &amp; Dunsmuir, S. (2017)</b></p> <p><b>*Harley, J. (2018)</b></p> <p>Craig, A., Blumgart, E., &amp; Tran, Y. (2011).</p> <p><b>*Kelman, E., &amp; Wheeler, S. (2015)</b></p>
3.An exploration of the mechanisms of change following an integrated group intervention for stuttering, as perceived by school-aged children who stutter (CWS) (Caughter & Dunsmuir, 2017)	1	<p><b>*Caughter, S., &amp; Crofts, V. (2018)</b></p> <p><b>*Freud, D., &amp; Amir, O. (2020)</b></p> <p><b>*Rodgers, N. H., Berquez, A., Hollister, J., &amp; Zebrowski, P. M. (2020)</b></p>	<p><b>*Caughter, S., &amp; Crofts, V. (2018)</b></p> <p><b>*Kelman, E., &amp; Wheeler, S. (2015)</b></p> <p><b>*Rodgers, N. H., Berquez, A., Hollister, J., &amp; Zebrowski, P. M. (2020)</b></p> <p><b>*Murphy, W. P., Yaruss, J. S., &amp; Quesal, R. W. (2007)</b></p>
4.The Role of Attention in Therapy for Children and Adolescents Who Stutter: Cognitive Behavioral Therapy and Mindfulness-Based Interventions Harley, 2018)	1	<p><b>*Mongia, M., Gupta, A. K., Vijay, A., &amp; Sadhu, R. (2019)</b></p> <p>Medina, A. M., &amp; Mead, J. S. (2021)</p> <p><b>*Rodgers, N. H., Berquez, A., Hollister, J., &amp; Zebrowski, P. M. (2020)</b></p>	<p><b>*Emge, G., &amp; Pellowski, M. W. (2019)</b></p> <p><b>*Plexico, L. W., &amp; Sandage, M. J. (2011)</b></p> <p><b>*Gupta, S. K., Yashodharakumar, G. Y., &amp; Vasudha, H. H. (2016)</b></p> <p><b>*Kelman, E., &amp; Wheeler, S. (2015)</b></p> <p><b>*Caughter, S., &amp; Crofts, V. (2018)</b></p>

			<p>*Mongia, M., Gupta, A. K., Vijay, A., &amp; Sadhu, R. (2019)</p> <p>*Caughter, S., &amp; Dunsmuir, S. (2017)</p>
5.Cognitive Behaviour Therapy with children who stutter (Kelman & Wheeler, 2015)	1	<p>*Caughter, S., &amp; Dunsmuir, S. (2017)</p> <p>*Caughter, S., &amp; Crofts, V. (2018)</p> <p>*Cooke, K., &amp; Millard, S. K. (2018)</p> <p>*Mongia, M., Gupta, A. K., Vijay, A., &amp; Sadhu, R. (2019)</p> <p>*Rodgers, N. H., Berquez, A., Hollister, J., &amp; Zebrowski, P. M. (2020)</p>	<p>*Harley, J. (2018)</p> <p>*Caughter, S., &amp; Dunsmuir, S. (2017)</p> <p>*Gupta, S. K., Yashodharakumar, G. Y., &amp; Vasudha, H. H. (2016)</p> <p>*Plexico, L. W., &amp; Sandage, M. J. (2011)</p> <p>Yaruss, J. S., Coleman, C. E., &amp; Quesal, R. W. (2012)</p> <p>*Caughter, S., &amp; Crofts, V. (2018)</p> <p>*Rodgers, N. H., Berquez, A., Hollister, J., &amp; Zebrowski, P. M. (2020)</p> <p>*Cooke, K., &amp; Millard, S. K. (2018)</p> <p>*Murphy, W. P., Yaruss, J. S., &amp; Quesal, R. W. (2007)</p>
6.Using Solution-Focused Principles With Older Children Who Stutter and Their Parents to Elicit Perspectives of Therapeutic Change (Rodgers et al., 2020)	2	0	<p>*Cooke, K., &amp; Millard, S. K. (2018)</p> <p>*Caughter, S., &amp; Dunsmuir, S. (2017)</p> <p>*Emge, G., &amp; Pellowski, M. W. (2019)</p> <p>*Caughter, S., &amp; Crofts, V. (2018)</p> <p>*Harley, J. (2018)</p> <p>*Freud, D., &amp; Amir, O. (2020)</p>
7.Parent perceptions of an integrated stuttering treatment and behavioral self-	4	<p>*Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2020).</p>	<p>*Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2020)</p> <p>*Druker, K. C., Mazzucchelli, T. G., &amp; Beilby, J. M. (2019)</p>

regulation program for early developmental stuttering (Druker et al., 2019)			
8.An Evaluation of an Integrated Stuttering and Parent-Administered Self-Regulation Program for Early Developmental Stuttering Disorders (Druker et al., 2020)	4	<b>*Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2019)</b>	<b>*Druker, K., Mazzucchelli, T., Hennessey, N., &amp; Beilby, J. (2019)</b>  <b>*Druker, K. C., Mazzucchelli, T. G., &amp; Beilby, J. M. (2019)</b>

\* Denotes duplicate articles from different searches

Figure A-1. PubMed Flow Diagram of Eligible Studies

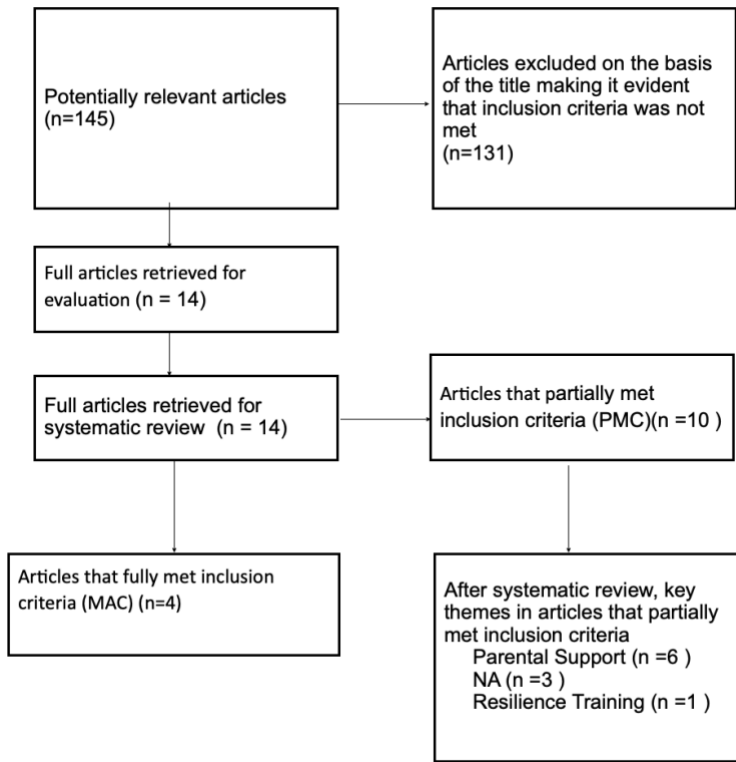


Figure A- 2. Key Themes of PMC Articles

**Key Themes:**

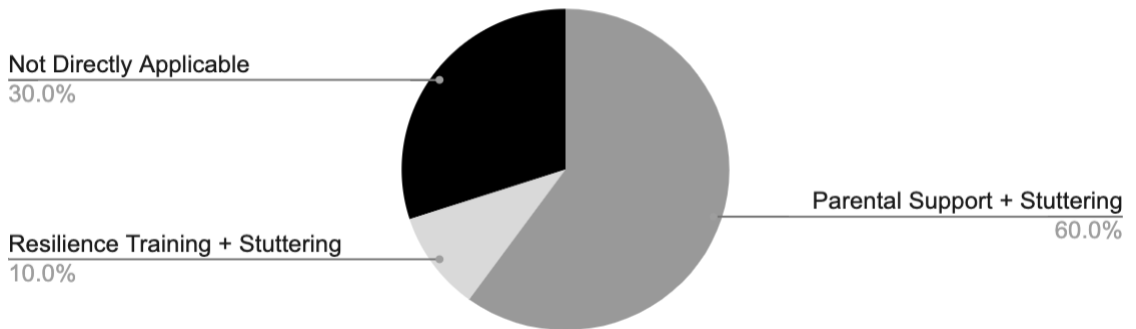


Figure A-3: Google Scholar Flow Diagram of Eligible Studies

