

Critical Review:

Is there a relationship between stuttering and depression in disfluent adolescents and adults?

Jessica Livingstone-Pountney & Erika Mitrevski
M.Cl.Sc. S-LP Candidates

Western University: School of Communication Sciences and Disorders

The following appraisal examined the existing evidence to determine whether there is a relationship between stuttering and depression in adolescents (ages 11-18) and adults. An electronic literature search yielded nine studies, which met inclusion criteria. Study designs included four case control studies, three cohort studies, and two survey research designs. Overall, the findings indicate that there is inconsistent evidence to conclude whether there is a significant relationship between stuttering and depression. Strengths and limitations of the reviewed studies, as well as clinical implications and recommendations for future research are included in this paper.

Introduction

Stuttering is defined as a speech disorder where there is a disruption to the flow of verbal output (Wingate, 1964). While the presence of a stutter can hinder an individual's communicative abilities, it has been found that persons who stutter (PWS) are subject to experiencing a multitude of negative consequences as a result of their atypical speech. Adolescents who stutter are more likely to be bullied and possess a decreased self-perception of their communicative competence (Blood & Blood, 2004; Erickson & Block, 2013). Adults who stutter have reported that their job performance has been adversely impacted (Klein & Hood, 2004; Klompas & Ross, 2009), they have experienced stigma because of their stutter (Boyle, 2018), and that they have an overall decreased quality of life (Craig, Blumgart & Tran, 2009).

Furthermore, the current fluency literature addresses an increase in the prevalence of anxiety, specifically social anxiety, amongst disfluent individuals across age groups (Mulcahy, Hennessey, Beilby, & Byrnes, 2008). Social anxiety has been suggested as a potential precursor to the development of depression (Stein et al., 2001). According to the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5), depression is a mood disorder where an individual experiences at least five of the following symptoms for two or more consecutive weeks: depressed mood, decreased interest in daily activities, fatigue or loss of energy, weight loss or weight gain, feelings of worthlessness, slowing down of thoughts or physical activity, inability to concentrate, and regular thoughts of suicide or death (American Psychiatric Association, 2013). Additionally, at least one of the symptoms must either be depressed mood or loss of pleasure in daily activities.

As mentioned, the presence of disfluent speech can lead to many negative consequences, and ultimately impact a person's psychological well-being. Although extensive research has been done to investigate the relationship between stuttering and anxiety, the research focusing on depression in PWS is scant (Stein et al., 2001). Evaluating the relevant literature on the relationship between stuttering and depression is important as it could ensure that Speech-Language Pathologists (S-LPs) are aware of the possible psychological consequences of a stutter. This research may also assist S-LPs in making appropriate referrals, as well as to support the development of therapy strategies or programs to best address the communicative needs of people who both stutter and have depression.

Objectives

The primary objective of this paper is to critically review the existing evidence that investigates the relationship between stuttering and depression in disfluent adolescents and adults. More specifically, whether the consequences of a stutter can lead to depressive symptoms.

Methods

Search Strategy

Articles included in this review were found using various computerized databases such as PubMed, Western Libraries, and Google Scholar. Search terms used included: (Depression) AND ((Stammering) OR (Stuttering)) NOT ((Psychogenic stuttering) NOT (Treatment)). Reference lists of the yielded articles were searched for additional articles pertaining to the research question.

Selection Criteria

Articles selected for review were required to include disfluent adolescents (ages 11-18) and adults whose stuttering was not identified as having a psychogenic cause. The studies were required to measure at least one variable related to depressive symptoms in order to determine if an individual who stutters is more susceptible to developing depression. Studies that included participants with comorbid disorders (e.g., language impairments) or who had previously received treatment for their stutter, were permitted for inclusion due to the limited evidence pertaining to this topic.

Data Collection

The above literature search resulted in nine articles. Of the nine articles, four were case control studies, three were cohort studies, and two used survey research designs.

Results

Matched Case-Control Studies

Case-control studies can be quasi-experimental in order to examine differences between groups and can also be correlational to identify whether there is a correlation between groups and a specific trait. A strength of this study design is that it controls for confounding variables (Niven, Berthiaume, Fick & Laupland, 2012); however, a limitation is its lack of group randomization.

Bray, Kehle, Lawless, & Theodore (2003) used a matched case-control design, which compared 21 adolescents who stutter with 21 control participants (ages 13-19) who did not stutter, in order to examine the relationship between self-efficacy for verbal fluency and academics, as well as depression. Participants were recruited through formal letters that were mailed to several school boards. The variables of interest were measured through modified formal assessment tools and gold standard tests. Appropriate statistical analysis revealed that there was no significant relationship between stuttering and depression.

Strengths of this study include a detailed explanation of the recruitment process, use of a control group, inclusion of psychometric properties for the tests used, and the reporting of sufficient procedural integrity. The limitations of this study include omission of inclusion and exclusion criteria, involvement of participants who have had past stuttering treatment, and no inter-rater reliability or blinding of the clinicians/researchers. Additionally, no participant demographic information was

provided, therefore it could not be determined if this study included participants with comorbid language impairments.

Overall, this study provides highly suggestive evidence that there is no significant relationship between stuttering and depression in adolescents

Iverach et al. (2010) conducted a case-control study to investigate mood and substance disorders in 92 participants (ages 18-73) who were pursuing speech therapy for their stutter, and 920 age- and gender-matched controls. Participants were recruited from seven university stuttering treatment clinics, and controls were selected from a National survey. A gold standard computerized interview was used to measure both mood and substance disorders, and this was completed in participants' homes. Appropriate statistical analysis revealed that when compared to the control group, individuals who stutter had increased odds of experiencing major depression within the 12 months prior to the onset of the study; however, this difference was not significant.

Strengths of this study include providing inclusion and exclusion criteria, reporting of the demographic information of the PWS, and the use of ten controls per each participant, which maximized the study's power. Furthermore, researchers provided the psychometric properties of the assessment used, and given that this was an online test, there were no concerns regarding interviewer bias. Limitations of this study include no report of demographic information for the control group, as well as the omission of documentation of stuttering severity, past-treatment history, and the prevalence of comorbid disorders for PWS. Additionally, due to the completion of the test in participants' homes, the reliability and validity of the results obtained are questionable.

Therefore, this study provides highly suggestive evidence that there is no significant relationship between stuttering and depression in adults.

Miller & Watson (1992) conducted a case-control study to examine the self-perceptions of anxiety, depression, and communication attitudes in 52 individuals who stutter (ages 16-68) and 52 non-stuttering individuals (ages 17-67). The measure of depression is the only variable relevant to this current review. Participants who stutter were recruited from the Dallas and Houston chapters of the National Stuttering Project (NSP), and the control group was recruited by being directly contacted or through a referral. Participants were asked to complete a self-

rating scale to identify stuttering severity. The variables of interest were measured using a questionnaire that was comprised of several gold standard instruments. Appropriate statistical analysis revealed that PWS were not more depressed than people who do not stutter.

Strengths of this study include a detailed description of participant demographic information, and the use of a measurement tool that was comprised of instruments which all had strong psychometric properties. Additionally, only one investigator scored all tests within the questionnaire, providing consistent scoring. Limitations of this study include the type of treatment previously received by PWS was neither controlled for nor reported, and there was no mention of where the participants completed testing.

Overall, this study provides highly suggestive evidence that there is not a significant relationship between stuttering and depression in adolescents and adults.

Tran, Blumgart, & Craig (2011) conducted a matched case-control study to investigate the rate of negative mood states in 200 adults (ages 18-85) who stutter, against 200 control participants who do not stutter. Participants were recruited through self-help groups, S-LP clinics, and hospitals. Stuttering and negative mood state variables were measured through conversational samples to determine stuttering severity, gold standard tests, and structured interviews. Appropriate statistical analysis revealed that PWS had significantly higher rates of depression, amongst other mood disorders, when compared to the control group.

Strengths of this study include a large sample size with high statistical power (>0.9), inclusion of detailed participant demographic information, adequate exclusion criteria, and the reporting of inter-rater reliability for the stuttering severity measure. Limitations of this study include having participants with previous treatment history partake in the study, and no report of any comorbid language disorders. Additionally, given that participants were recruited from self-help groups, this may not have been an adequate representation of the stuttering population.

Overall, this study provides highly suggestive evidence that there is a relationship between stuttering and depression in adults.

Cohort Studies

Cohort studies can be done retrospectively or prospectively and are used to follow the outcomes of

two groups over a certain period of time. Strengths of this study design include an appropriate representation of temporal sequencing and it permits the calculation of incidence, while some limitations are that they can be expensive as well as time consuming (prospective), and data records may be of poor quality if they were not designed for the study (retrospective) (LaMorte, 2016).

Gunn et al. (2014) conducted a cohort study that investigated the psychological state of 37 adolescents (ages 12-17) who stutter that were pursuing speech therapy. Of the 37 participants, a younger group (ages 12-14) and an older group (ages 15-17) were established to examine any differences in variables across ages. Participants were recruited from waiting lists at university-affiliated stuttering treatment clinics. Stuttering and psychological states were measured through self-report, checklists, phone calls, and gold standard tests. Statistical analysis revealed that depression scores were considered to be within the normal range, although it was found that the older group had a higher mean of depression when compared to the younger group.

Strengths of this study include providing eligibility criteria for participants, inclusion of the psychometric properties for the tests, and the division of participants into younger and older groups for more accurate data analysis. Limitations of this study include that only t-test values were reported in the statistical analysis, and various components of the assessment were completed at the participants' homes, thus the reliability and validity of the scores are not compelling. Furthermore, participant demographic information was omitted (e.g., past treatment history, comorbid disorders, etc.), causing the representativeness of the participants amongst the stuttering population to be questionable.

Overall, this study provides highly suggestive evidence that there is not a significant relationship between stuttering and depression in adolescents.

Iverach et al. (2017) used a cohort study with 57 younger (ages 11-14) and 45 older (ages 15-17) adolescents who stutter to investigate the relationship between stuttering severity, psychological functioning, and the impact of stuttering in adolescents. Participants were recruited from treatment waiting lists at university-affiliated stuttering clinics in Australia. The study was conducted during the participants' initial assessment for treatment, and each completed various self-reports and gold standard speech and psychological measures. Appropriate statistical analysis revealed

that depression scores for all groups fell within normal limits.

Strengths of this study include the reporting of psychometric properties for the tests, reporting of the eligibility criteria of participants, and the division of participants. Limitations of this study include no information provided regarding where the assessments took place, or who was present during the administration and scoring of the measures. Additionally, it was noted by the authors that various participants were individuals who sought treatment for their stutter, thus results cannot be generalized to the stuttering population.

Overall, this study provides highly suggestive evidence that no significant relationship between stuttering and depression exists for adolescents.

Manning & Gayle Beck (2013) conducted a cohort study using 50 adults who stutter (ages 18-71) to examine the relationship between stuttering severity and personality features, social anxiety, trait anxiety, and depression, of which only the latter is relevant to the current review. Participants were recruited through both electronic and telephone communication from six universities and two private clinics. All psychological and fluency variables were measured using gold standard tools. Appropriate statistical analysis revealed that depression was not significantly associated with stuttering severity.

Strengths of this study include providing detailed participant demographic information, use of tools with strong psychometric properties, and acceptable inter-rater reliability for measures related to stuttering. Limitations of this study include lack of detail regarding the recruitment process and test administration, omission of inclusion and exclusion criteria, and no report of blinding of evaluators. Furthermore, involvement of participants being at various stages of receiving treatment for their stutter was not controlled for, and a comorbid language impairment was reported for one participant.

Overall, this study provides highly suggestive evidence that there is not a significant relationship between stuttering and depression in adults.

Survey Research Designs

Survey research is a large-scale design that can be used to identify certain characteristics within a specific population. A limitation of this design is that there are no intentional manipulations of the variables studied.

Ardila et al. (1994) used a survey research design to investigate the prevalence of stuttering amongst 1879 Spanish-speaking university students (ages 17-50) and its relation to central nervous system risk factors, associated disorders, and depression symptoms. Participants who stutter (n= 37) were not specifically recruited, but rather self-identified during the time of study. An adapted questionnaire was used to reveal the frequency of PWS, and whether there was a relationship between disfluent speech and the variables of interest, namely depression. Appropriate statistical analysis revealed that six of the seven depression symptoms were reported as being more prevalent in the stuttering group.

Strengths of this study include a detailed explanation of the questionnaire content. Limitations of this study include the omission of the psychometric properties for the adapted questionnaire, and that participants were self-identified as being PWS as opposed to the researchers relying on medical records or assessment results. Self-identification poses the implication of potentially including inappropriate participants in the stuttering group. Additionally, it is possible that participants with comorbidities and previous treatment for their speech were included, although they were not reported.

Overall, this study provides equivocal evidence that there is a significant relationship between stuttering and depression in older adolescents and adults.

Boyle (2016) conducted a survey research design to examine if there is a link between various causal attributions and psychological well-being in 348 individuals who stutter (ages 18-84). Participants were recruited through S-LPs and various self-help groups. Emails containing an assessment survey were sent to specialists in fluency disorders and individuals who were apart of the National Stuttering Association (NSA) to subsequently send to PWS. Depression was measured using a survey consisting of self-reporting screening tools. Appropriate statistical analysis indicated that there is a correlation between stuttering and depression, and that participants older than 65 years old were significantly less depressed than those who were 25 to 38 years old. It was also found that an increase in externally controlled perceptions of stuttering was correlated with an increase in depression symptoms.

Strengths of this study include a detailed description of the participant recruitment process, and reporting of the psychometric properties for the screening tool that measured major depression. Limitations of this study include using participants who have received

past treatment or support for their speech impairment; therefore, participants were not representative of the general stuttering population. Additionally, causal assertions cannot be made because the study was correlational in nature.

Overall, this study provides somewhat suggestive evidence that there is a significant relationship between stuttering and depression in adults.

Discussion

This critical review set out to investigate the relationship between stuttering and depression in adolescents and adults. Of the nine analyzed articles, overall results were found to be inconsistent in showing a significant relationship between these two variables.

Six of the nine articles examined the relationship amongst adults. Of these six articles, three revealed a significant relationship between stuttering and depression (Ardilla et al., 1994; Boyle, 2016; Tran et al., 2011), one study indicated a non-significant relationship between the stuttering and depression variables (Iverach et al., 2010), and two studies revealed no significant relationship between stuttering and depression (Manning & Gayle Beck, 2013; Miller & Watson, 1992). Three of the nine articles investigated the relationship between stuttering and depression in adolescents, and all found no significant relationship. (Bray, 2016; Gunn et al., 2014; Iverach et al., 2017).

Recurring weaknesses were noted in the studies reviewed. Many studies used PWS that were either seeking treatment for their stutter during the study, in treatment at the time of the study, or had previously received treatment before participating in the study. This treatment variable was not controlled for in the analyzed articles, which may skew the results that were found. Comorbid disorders, specifically language disorders, were only reported in two of the nine studies (Ardilla et al., 1994; Manning & Gayle Beck, 2013). Including participants with comorbid disorders and not controlling for this variable may have affected the results, as those with comorbid disorders may face more adversities that can contribute to the development of depression.

Stuttering severity ratings were also not consistently controlled for or reported across studies. Three of the nine studies measured stuttering severity using gold standard tools and found no significance with stuttering severity (Iverach et al., 2017; Manning & Beck, 2013; Tran et al., 2011); however, due to only

a small portion of studies reporting a stuttering severity variable, a conclusive decision regarding its inclusion cannot be determined. Finally, the goal of this review sought to determine the prevalence of depression amongst PWS; however, the included studies used various measurement tools to determine the prevalence of depression amongst PWS. The measurement tools that were used were either gold standard or constructed by researchers.

Given that previous treatment experience, comorbid disorders, and stuttering severity were not uncontrolled for, and various depression measures were used, it may be inappropriate to generalize the results of the current studies to the general stuttering population.

Clinical Implications

Given the weaknesses and inconsistent results that were yielded in this critical review, results should be interpreted with caution. However, it was mentioned that three studies revealed a significant relationship between stuttering and depression in adults. Therefore, it is important for S-LPs to understand the potential relationship between stuttering and depression. S-LPs should be cognizant of the depressive symptoms that are listed in the DSM-5 and be prepared to refer a PWS to a professional who is qualified to investigate their psychological well-being. Additionally, S-LPs may want to consider administering a depression screener during fluency assessments to ensure that depression in PWS is not overlooked.

Future Recommendations

Further research should be conducted to determine the prevalence of depression amongst adolescents and adults who stutter, as the relationship between stuttering and depression has yet to be determined. Moreover, based on the findings, studies should separately examine adolescents and adults who stutter in order to investigate possible age-related differences in the development of depression. Future studies should also consider the implications of not controlling particular variables, such as individuals who have comorbid speech and/or language impairments, previous treatment experience, stuttering severity, as well as use consistent gold standard depression measures.

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