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A Review of Traumatic Brain Injury in School Psychology Journals

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A REVIEW OF TRAUMATIC BRAIN INJURY IN SCHOOL PSYCHOLOGY JOURNALS

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ABSTRACT

A REVIEW OF TRAUMATIC BRAIN INJURY IN SCHOOL PSYCHOLOGY JOURNALS

TBI is the leading cause of childhood injury, death, and disability. School psychologists play a key role in providing students with TBI services within the school setting; therefore, it is essential for school psychologists to be familiar with TBI research. Previous research indicates a lack of TBI literature within school psychology journals. The current review examined TBI publications in school psychology journals over the past 38 years to provide an update on issues raised by Smith and Canto (2015). Eight school psychology journals were examined to gather data about the frequency of articles related to TBI, types of TBI articles, and topics discussed. The frequency of publications was analyzed which highlighted the discrepancy between the number of children impacted by TBI and the research within school psychology journals. The review includes a comparison between empirical and nonempirical articles related to TBI. Results also found that testing and recommendations are the most prevalent topics within TBI-related articles. Limitations and implications are discussed.

Keywords: traumatic brain injury, school psychologist, school-based supports,

For K-Jay

You are renewed hope, and I am joyous to love you.

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Introduction

Traumatic Brain Injury

Traumatic Brain Injury (TBI) is defined by the Centers for Disease Control and Prevention (CDC, 2022) as "an injury that affects how the brain works and results from external forces (e.g., bump, blow, jolt, or penetrating injury to the head). As the leading cause of childhood injury, death, and disability, TBI impacts approximately 700,000 children from ages 0-19 each year (Davies & Ray, 2014; Faul et al., 2010; Jantz et al., 2015). Of those that endure a TBI, 80-90% will have a mild TBI and the remaining will have moderate or severe TBI (Bigler, 2012; Coronado et al., 2012; Corrigan et al., 2010; Jantz et al., 2015), all of which can have long-term effects. These effects can cause a range of deficits within multiple areas (e.g., cognitive, behavioral, and/or academic) that create a need for individualized psychoeducational services within a school setting.

The Glasgow Coma Scale is typically used to classify TBI severity in a medical setting soon after the occurrence of the head injury. This scale provides a score based on an individual's responsiveness in three areas: eye-opening, motor, and verbal responses. Various responses for each area are coded on a scale, added together, and scored. A lower score corresponds to less responsiveness: 13-15 is a mild TBI, 9-12 is a moderate TBI, and 3-8 is a severe TBI. The impact of TBIs can vary among severity level. Most people that experience a mild TBI will not have detectable problems when returning to normal activities (Bigler, 2012; Davies, 2014). However, even a mild TBI can result in attention or concentration problems, memory problems, trouble thinking clearly, feeling more emotional, and feeling tired (CDC, n.d.). An injury of moderate or severe TBI will have a larger impact on individuals and can expect to experience some degree of permanent impairment (Davies, 2014). Potential effects of a moderate or severe

TBI can include difficulty understanding and thinking clearly, problems concentrating, weakness with motor skills, feeling more angry or aggressive than usual, and personality changes (CDC, n.d.).

More than 145,000 children with a TBI experience various effects (e.g., social, behavioral, physical, or cognitive) within the school setting (Glang et al., 2017; Zaloshnja et al., 2008); however, data from the National Center for Education Statistics (2022) reported that far fewer students, approximately 25,000, were served under the special education classification of TBI during the 2020-21 school year. School-aged children are at the highest risk of obtaining TBIs which emphasizes the need for knowledge, skills, and self-efficacy of practitioners when inevitably serving students and families with TBI in schools (Arroyos-Jurado & Savage, 2008; Davies & Ray, 2014; Glang et al., 2017).

Family Impact

A child with a TBI impacts the functioning of the family. Whiffin et al. (2015) describes the changes within a family dealing with a TBI as "neither a one-dimensional outcome, endpoint in the recovery journey, or a stage to be reached and then accepted and adjusted to" (p. 855). Unlike other crises, when a TBI is sustained, responsibilities, and expectations within a family are required to change to support the injured family member (Jantz et al., 2015). When a family member has a TBI, there are constant changes that impact the entire family system. This creates a lack of equilibrium, ensuing a challenge to find balance again. As facets ebb and flow, the system develops and evolves to help regain homeostasis and a sense of regularity (Jantz et al., 2015; Matthews et al., 2012).

On top of structural changes, a TBI can cause psychological distress. Families with a child with TBI may have unrealistic expectations of the future which can exacerbate distress and

cause grieving of what could have been (Buckland et al., 2021; Jantz et al., 2015). Coping with TBI requires constant adaptation for the next change occurring which makes acceptance an unrealistic goal (Verhaeghe et al., 2005; Whiffin et al., 2015). Targeted interventions can help families work through the grieving process, reduce effects of stress, and rely on healthy coping strategies (Harris et al., 2001; Jantz et al., 2015; Verhaeghe et al., 2005). It has been found that problem-oriented coping (i.e., focus efforts on cause of stress) is more effective than emotion-oriented coping aimed at reducing an individual's negative emotions from the stress-inducing situation (Leach et al., 1994; Linn et al., 1994; Verhaeghe et al., 2005). Problem-oriented coping leads to better adaptive choices and can improve resilience, while emotion-oriented coping is associated with maladaptive strategies such as escape, distress, and burden. Programs for family resilience and social support can reduce burdens and promote mental health (Harris et al., 2001).

The coping process is impacted by factors related to family characteristics and relationships. Negative emotional and behavior outcomes have been found in family units with a TBI when effective coping skills or supports are not being adopted (Jantz et al., 2015; Verhaeghe et al., 2005). The severity of the injury can increase victim problems which has a strong correlation with family emotions. Verhaeghe et al. (2005) reported finding correlations between parental stress and depression with an increase in children's behavioral issues and such issues had bidirectional influences. Furthermore, they reported siblings of children with TBI were found to have emotional issues due to the impact on the family. Finally, the authors reported that families with the highest vulnerability to increased stress are young families with multiple children and those that have conflict with professionals (Verhaeghe et al., 2005).

The coping process is also impacted by caregiver's resilience, or "the ability to adapt in the face of tragedy, trauma, adversity, hardship, and ongoing significant life stressors" (Newman,

2005, p. 227). Anderson et al. (2020) found that "resilience was associated with higher scores in extraversion, self-efficacy and problem-focused coping and then displayed both direct and indirect pathways to caregiver outcome variables" (pp. 1937-1938). Adjustment has been found related to perceived levels of social support and stressors. Anderson et al.'s study also noted that when stressors were viewed as highly distressing, caregivers had higher depression scores. Support can help alleviate depression and adverse family effects. Anderson et al. also found that resilience mitigated caregiver burden when social support was in place. Effective support leads to better emotional adjustment and programs targeting family resilience may promote positive mental health and reduce caregiver burden (Anderson et al., 2020).

School and TBI

As previously discussed, families of students with TBI have responsibilities requiring them to care for the unique needs of their child, comprehend complicated information, and manage the family structure/health. There is a deep need for continued support within multiple aspects of managing these responsibilities; educators, specifically school psychologists, can provide support in the school setting for students with TBI.

Parents of children with disabilities identified access to information and services, financial issues, school and community inclusion, and family support to be some of the many barriers to the well-being of their family (Davies, 2020; Resch et al., 2010). Enacting supports for families and students have the potential to make schools cost effect service providers. Specifically, many children with TBI will need direct and indirect supports in place to meet their educational needs when they are in school. Direct supports will help them succeed within the classroom with positive behavior supports, management procedures, and specific academic

services. Indirect services will provide teachers with training and extra resources they need to effectively serve students with TBI.

As previously stated, effective support can aid in better emotional adjustment within families and result in improved student outcomes. For some families, schools may be the primary source of information on the resources and services available for their child. After children have received and been discharged from medical care, the effects of their TBIs can still present concerns academically and behaviorally within educational settings. These areas of concern allow school-based professionals to be proactive about educating and supporting families immediately following the injury and continually in the future (Davies, 2020). However, it is noted that parent dissatisfaction with their child's educational services is related to staff's lack of knowledge about TBI and the impact it has on student outcomes (Davies, 2014; McGrath, 2010)

School Psychologists' Roles

Due to their variety of responsibilities, school psychologists play a key role in providing students with TBI services within the school setting. Their unique position allows them to be consultants and service providers, meaning they forge a network of relationships with students, families, and educators to cater to individual student needs. One of their more encompassing roles is to simplify information into an understandable form and provide direction for future advances so all stakeholders have the knowledge they need going forward (Newby, 2013). To be successful, school psychologists must approach their work in a structured yet flexible manner to reasonably anticipate needed student supports and maintain replicable processes (Newby, 2013). Throughout this approach to service providing, school psychologists need to be realistic within their processes and expectations, as well as working with their consultees and clients within the contexts of their lives (Newby, 2013).

Professional Standards

School psychology programs are accredited through the National Association of School Psychologists (NASP) which provides Professional Standards that "should serve as a foundational guide for professional practice and ethical decision-making" (NASP, 2020). The NASP 2020 Professional Standards consist of four individual documents: Model for Comprehensive and Integrated School Psychological Services (also known as the NASP Practice Model), Standards for Graduate Preparation of School Psychologists, Standards for the Credentialing of School Psychologists, and Principles for Professional Ethics.

The NASP Practice Model works to ensure that school psychologists can use their skills and expertise within their comprehensive role in the school system to provide the most effective, efficient, and quality services to all parties. Additionally, Standards for the Credentialing of School Psychologists requires continued professional development (CPD) with specification of a certain number of hours from categories of ethics or legal regulation as well as equity, diversity, and inclusion. School psychologists should seek continued growth in all domains and organizational principles of the practice model to meet the specific needs of their school communities. NASP's Principles for Professional Ethics provides minimal guidance to practitioners, only creating a basis of responsibilities to which school psychologists must adhere and requires professional judgement within practice. Moreover, the NASP Standards for Graduate Preparation of School Psychologists encompasses all three documents as "a unified set of national principles that guide education, credentialing, professional practices, and ethical behavior of effective school psychologists" (NASP, 2020).

Educational Law

School psychologists are a valuable resource for the school system, guardians, and other professionals when it comes to knowledge of disability criteria and student rights in an educational setting. Their expertise in this area is beneficial since information about state and federal protections may not be universal for all parties working to provide services for a student with TBI.

The Individuals with Disabilities in Education Act (IDEA, 2004) provides children with disabilities a free appropriate public education (FAPE) and ensures special education and related services to those children. IDEA covers a variety of rights and services, starting as young as birth and going through the age of twenty-one. As of the 2020-21 school year, IDEA was regulating early intervention, special education, and related services to more than 7.1 million children with disabilities (National Center for Education Statistics, 2022). The Every Student Succeeds Act was put into place in 2015, in which Congress states:

> Disability is a natural part of the human experience and in no way diminishes the right of individuals to participate in or contribute to society. Improving educational results for children with disabilities is an essential element of our national policy of ensuring equality of opportunity, full participation, independent living, and economic self-sufficiency for individuals with disabilities. (ESSA, 2015)

TBI became one of thirteen disability categories in 1990 under IDEA. School psychologists are a key team member in determining eligibility under IDEA, providing guidance about services to meet students' educational rights and needs. As previously mentioned, over 25,000 individuals from 3-21 years of age were provided services under the category of TBI during the 2020-21 school year (National Center for Education Statistics, 2022). There is a huge

discrepancy between the number of children with TBI and those determined eligible for special education. While this may suggest TBI is under-identified, this discrepancy could be due to children being released from medical care after a head injury without a perceived need for services. Therefore, students transition back to school without extra supports in place. Students that experience a TBI could also be served under a Section 504 plan which allows them to have additional accommodations due a medical need. The Rehabilitation Act of 1973, amended as Section 504, ensures that those with disabilities will not be excluded or denied equal opportunity to receive benefits and services from federally funded programs. The implementation of these various school-based services increases the importance of NASP's Professional Standards for guiding school psychological services and highlights the need for increasing the self-efficacy of professionals that will be providing services to students with a TBI.

While IDEA (2004) is responsible for providing funding to ensure students have FAPE, Section 504 and the Americans with Disabilities Act of 1990 (Title II) provide more regulations and protections against discrimination within schools and other agencies but do not provide funding themselves. Students that are not found eligible under IDEA will also be protected under these laws in and out of the educational environment. Immersed in work revolving around disability legislation, school psychologists have extensive knowledge and experience with these protections. This allows them to relay details to other parties about rights, eligibility, and services offered, keeping everyone informed of the processes at hand.

Students with TBI will be protected by the legislation above but may also have specific protections under Return-to-Learn. "At least nine states have "return-to-learn" provisions requiring schools, districts, or states to establish protocols for transitioning students back to school following a TBI. A few other states considered legislation requiring or encouraging

"return-to-learn" protocols in 2017" (National Conference of State Legislators, 2017). Kentucky is not one of the nine states that have, or are considering, a return-to-learn law.

Consultants and Service Providers

With job responsibilities so extensive, an explanation is required to break down the multitude of roles within the school psychology profession. First, school psychologists use collaboration efforts to build and maintain relationships with students, families, and other professionals to take a proactive approach to service providing. When serving students with TBI, fostering relationships with families and other involved professionals can provide important information for school psychologists. Care physicians, therapists, social workers, etc. may be able to provide evidence for services within schools. A basis of current and previous knowledge about the health and well-being of families and students can allow support services to be tailored to the unique needs of each individual case.

Many school psychologists have responsibilities to assess for academic and behavioral supports within their districts. These supports range from Response to Intervention (RTI) to special education services to provide support needed to help students achieve a desired level of success. Maintaining accurate and detailed records allows for steady progress throughout cases (Davies, 2014). When a change occurs, this can lead to an increase in visibility of concerns which can increase the likelihood that appropriate services will be rendered. These records allow for information to be viewed in reference to the time frames in which they occurred to make educated hypotheses about behavioral and/or academic changes within students that experience a TBI (Davies, 2014).

When in the evaluation process, there are a multitude of assessment activities that a school psychologist can complete to provide important information to all parties involved.

School psychologists are trained and certified to use standardized testing assessments, curriculum-based measures, and functional behavior assessments to determine student needs and the severity of those needs. These measures cover an array of concerns that would be noted in a student with a TBI: psychological, academic, and behavioral. Based on outcomes of the evaluations, these tools lead to the implementation and progress monitoring of specialized interventions in the school setting. According to Gfroerer et al. (2008), interventions for behavioral concerns was the biggest unmet need in students with TBI.

Training

In a school setting, teachers are expected to meet students where they are, provide instruction, and propel them towards success. These same expectations are placed on all staff working with special education students in the general or special education setting. However, Ettel et al.'s (2016) study found that teaching staff have low self-efficacy when working with students that have TBIs. Their self-efficacy is related to their level of preparedness, confidence, and skills when providing support and services in academic settings (Ettel et al., 2016). This study brings up more questions regarding the knowledge that staff should have about TBI. When Ettel et al. looked at textbooks used in programs for special education educators, they found low coverage of TBI. Once they conducted a survey about the self-efficacy of general and special education teachers working with TBI, they found that both groups were below a 60% threshold and not meeting competency standards of at least 70%. Educators have been relying on the use of previously learned strategies when working with students with TBI. However, training has been found to be better than trial and error when working with this vulnerable and unique population (Davies & Ray, 2014; Ettel et al., 2016).

Students with TBIs will require specialized services and it is important to bring awareness to the needs and impact that TBI can have in a student's life. This can lead to an advancement in prevention activities and quality training. Identifying the prosocial and maladaptive risks in student outcomes without intervention can lead to better practices. As stated previously, behavior was the biggest unmet need for students with TBIs. Sharing this information with educators can help create buy-in when working to increase knowledge and provide trainings about TBI within the school setting.

School psychologists should be well equipped to help with the professional development of other school staff, especially in relation to disability categories. This would make them good candidates for providing knowledge, support, interventions, tips, and more to general and special education staff. This effort can be done in response to an incident or as preventative measures before an incident occurs. School psychologists can also consult with teachers to provide training, practice, and feedback on strategies used within the classroom for students with TBI.

School psychologists are also in a position to provide support and guidance to parents. With their specialized expertise, they can be viewed as an expert and are knowledgeable, not only about disabilities, but also the student's history. Families may not know the extent of school-based services for a student with TBI or the difference between professional and school care. As experts knowledgeable of eligibility requirements, they understand the supports provided within the school setting in relation to student needs. School psychologists also have access to student information about students' general and special education history prior to a TBI occurrence. This information can help them make data-based decisions and provide adequate support to all working to help the student in an easily understood manner.

Current School Psychology Practices and TBI

Research indicates that students with TBIs, and family outcomes of students with TBIs, are more successful with increased school psychologist self-efficacy about TBI disability criteria (Davies & Ray, 2014). Currently, in the field, there is a lack of training around TBI disability criteria, and Davies and Ray (2014) found that school psychologists have low self-efficacy when working with students with TBIs. They also found that trainings led to high self-efficacy; however, the length of time since trainings showed lower knowledge and skill (Davies & Ray, 2014).

School psychologists who have high self-efficacy in working with students with TBIs are likely to feel confident and competent in their ability to provide appropriate interventions and support to these students. This can lead to better outcomes for the students, as the school psychologist is more likely to act and provide effective support. In addition to the need for increased training and support for school psychologists working with students with TBI, it is important to recognize the critical role of early identification and intervention in achieving positive outcomes. School psychologists must be trained to recognize the signs of TBI in students and to provide appropriate interventions as soon as possible (Glang et al., 2017).

Consultation can be used to increase successful services for students with TBIs. This will allow professionals to grow their knowledge base and practice skills that will better serve all students. Effective support for students with TBI requires collaboration with other professionals, such as occupational therapists, speech-language pathologists, and medical professionals. Therefore, it is essential for school psychologists to attend training on how to work effectively with other professionals and how to create interdisciplinary teams to support students with TBI (Davies & Ray, 2014).

To keep up to date with latest research and best practices, school psychologists need workshops and webinars, as well as participating in online forums and communities of practice (Davies & Ray, 2014; Steinert et al., 2008; Steyn, 2006). Professional Development trainings (PD) can also address these knowledge and skill deficits. Attending a PD training can help increase an individual's skill base, which can lead to change in practice (Davies & Ray, 2014; Steinert et al., 2008; Steyn, 2006). NASP re-certification allows school psychologists to receive credits for self-study on a topic of their choice by reviewing the literature and becoming familiar with the resources available. Completing self-study credits by reviewing TBI literature would be beneficial for school psychologists to build upon their knowledge and skill-base when working with students that have a TBI. In addition to books related to TBI, school psychologists have several professional journals where they can obtain practice information. However, Smith and Canto (2015) searched for TBI-related articles within school psychology journals almost a decade ago and found that there is a shortage of articles relating to TBI. Out of a total of 7,356 articles published in the school psychology journals between 1985 and 2014, only 17 were related to TBI which was 0.23% of articles published within the journals (Smith & Canto, 2015).

To identify specific trends of TBI publications, Smith and Canto (2015) looked at what proportion of articles was empirical versus nonempirical and found that 9 of the 17 (52.9%) TBI-related articles were empirical (i.e., original research articles). They also searched for the frequency of recommendations, accommodations, modifications, and interventions within TBI-related articles; results indicated 180 instances within the 17 articles reviewed. The frequency of topics in TBI service delivery (e.g., psychological testing, training of professionals, and transition to school) were reviewed, and Smith and Canto (2015) identified that psychological testing was the most prevalent topic mentioned in TBI-related articles.

Purpose of the Current Study

As the leading cause of childhood injury, death, and disability, it is essential for school psychologists to be familiar with TBI research. Research reviewed about TBIs within schools indicated that increasing school psychologists' knowledge of TBI has led to improved outcomes for students (Davies, 2014). Current school psychological research has shown that school psychologists have a lack of knowledge and training about TBIs (Davies, 2013; Davies, 2014; Glang et al., 2017). A previous review of TBI articles in the school psychology literature occurred through 2014 (Smith & Canto, 2015). The current review also examined TBI publications in school psychology journals to provide an update on findings by Smith and Canto (2015), such as the frequency of including the topics of transitions, training, testing, and recommendations pertaining to TBI. By examining the school psychology literature, an awareness of the issues with TBI in our field was summarized which highlighted the need for additional research in specific areas. Eight school psychology journals (i.e., *School Psychology Review*, *Journal of School Psychology*, *Psychology in the Schools*, *School Psychology Quarterly* [now called simply, *School Psychology*], *Journal of Applied School Psychology*, *Contemporary School Psychology*, *School Psychology Forum*, and *School Psychology International*) were examined to gather data about the frequency of articles related to TBI, types of TBI articles, and topics discussed.

Specifically, the following research questions, based on the research questions previously examined by Smith and Canto (2015), will be addressed:

1. How frequently do school psychology journals publish articles related to TBI?
2. What proportion of articles related to TBI is empirical versus nonempirical and what types of empirical articles are published?

3. How often are the topics of transition, testing, training, and recommendations included in articles related to TBI?

Method

Procedure

An electronic search was conducted through WKU libraries' EBSCOHost computer database using APA PsychInfo, APA PsychArticles, and Psychology and Behavioral Sciences Collection with the key words "TBI or Traumatic Brain Injury." Since this review is investigating TBI within school psychology, results were refined to the following eight school psychology journals: *School Psychology Review*, *Journal of School Psychology*, *Psychology in the Schools*, *School Psychology Quarterly* (now called simply, *School Psychology*), *Journal of Applied School Psychology*, *Contemporary School Psychology*, *School Psychology Forum*, and *School Psychology International*. These journals were chosen because of their prominence within the school psychology field and relevance to practice in the United States. The *Canadian Journal of School Psychology* was excluded because their publication emphasizes practice in Canada. *School Psychology International* was included, however, because its articles often originate from the United States. In addition to the EBSCOHost search, the website for the National Association of School Psychologists was also searched using the term, TBI or traumatic brain injury, to find articles within the journal, *School Psychology Forum*. Search results within these eight journals using those two electronic searches yielded 36 articles from 1985 to 2022.

The abstracts of these 36 articles were reviewed to determine if they were appropriate for inclusion in this review. Of those articles, five were book reviews and were excluded from this review. Additionally, four articles were excluded because the content of those articles did not focus on TBI issues. Specifically, two articles focused on standardized tests and within their participant sample, a small percentage of students with TBI were included but no results were mentioned for the TBI participants. One article simply mentioned TBI as a health-related issue in

childhood but did not further discuss TBI. The fourth excluded article focused on neuropsychological assessment and only mentioned TBI without any other discussion on the assessment of TBI. As a result of excluding those nine articles, 27 articles from 1985-2022 remained and were included in the data analysis. These articles are listed in Appendix A.

Data Analysis

To determine how frequently TBI-related articles were published in school psychology journals, the years of publication from the articles were noted and the number of articles published from 1985-2022 were counted. Results are presented in a table listing the chronological order of the publications as well as through a cumulative graph showing the number of publications over time.

As conducted by Smith and Canto (2015), articles were initially classified into two broad categories (i.e., empirical and nonempirical) to gather information about the types of articles published related to TBI. Empirical articles were articles where research was conducted (i.e., applied interventions with measured outcomes, survey types, and other types). Nonempirical articles were articles including discussion of previous research (e.g., literature review, narrative). Unlike Smith and Canto, the empirical category was further divided into subcategories to get specific information on the types of research published related to TBI and those subcategories were: (a) applied an intervention and measured outcomes, (b) survey types of research, and (c) other types of research, which would be anything other than applied interventions and surveys (e.g., examined pre-existing data).

For all articles, both empirical and nonempirical, information was compiled on the topics discussed and the frequency of articles including those topics. Articles were reviewed for the

following four topics: transition, testing, training, and recommendations. Table 1 provides the criteria for categorizing the four topics from the articles.

Inter-rater agreement was checked for a sample of 26% of the articles to verify the coding of the articles into empirical or nonempirical categories, as well as the inclusion of the four topics of transition, testing, training, and recommendations. Two school psychology graduate students were asked to review articles and were provided the criterion for inclusion. The resulting inter-rater agreement for categorizing into empirical or nonempirical categories was 100%. In determining specific topics, an inter-rater agreement of 89.3% was obtained. The high rates of agreement suggest the categorization of articles was accurate.

Table 1

Criteria for Topics within TBI Articles

	Criteria for Empirical Articles	Criteria for Nonempirical Articles
Transition	Did the researcher(s) put a plan, protocol/procedure, and/or monitoring system in place to measure student outcomes after a return to school following a TBI?	Is there discussion about planning, protocol(s)/procedure(s), and/or monitoring of the return to school after a TBI has occurred?
Testing	Did the researcher(s) conduct psychological, neurological, and/or academic assessment(s) to assess, monitor, and/or determine placement options for children with TBI?	Did the article discuss/explain psychological, neurological, and/or academic assessment(s) to assess, monitor, and/or determine placement options for children with TBI?
Training	Did the researcher(s) conduct professional training in relation to direct and indirect supports for children with TBI?	Did the article discuss/explain professional training in relation to direct and indirect supports for children with TBI?
Recommendations	Is there guidance for school-based supports containing accommodations, modifications, or interventions based on research conducted within the study?	Is there discussion with an emphasis on school-based supports containing accommodations, modifications, or interventions?

Results

Frequency of TBI Publications

The first research question sought to determine the frequency of publication of TBI-related articles in school psychology journals. A total of 27 articles from the eight journals were included in this review. Table 2 provides a list of the articles included within the review in order of publication year along with the journal title and article type. Twenty-seven articles found over a 38-year period averages to 0.71 articles published per year. Figure 1 shows cumulative data for articles related to TBI published throughout the years. Although Smith and Canto (2015) included three articles from the 1980s, they were excluded from this analysis because of the exclusionary criteria described earlier. Specifically, one of those articles from the 1980s was a book review, one focused on a test, and one discussed neuropsychological testing. Figure 1 shows a slow rise in articles published from 1990-2014. The year 2015 saw a jump of TBI articles published, largely because a special issue of *School Psychology Forum* focused on the topic of TBI that year. A few more TBI articles were published in the following years, but none in the last two years (i.e., 2021-2022). *School Psychology Forum* had the most TBI-related articles over the period of time reviewed with a total of seven articles published. *School Psychology* (*Quarterly*) and *School Psychology International* had the lowest number of TBI-related articles published (one article each).

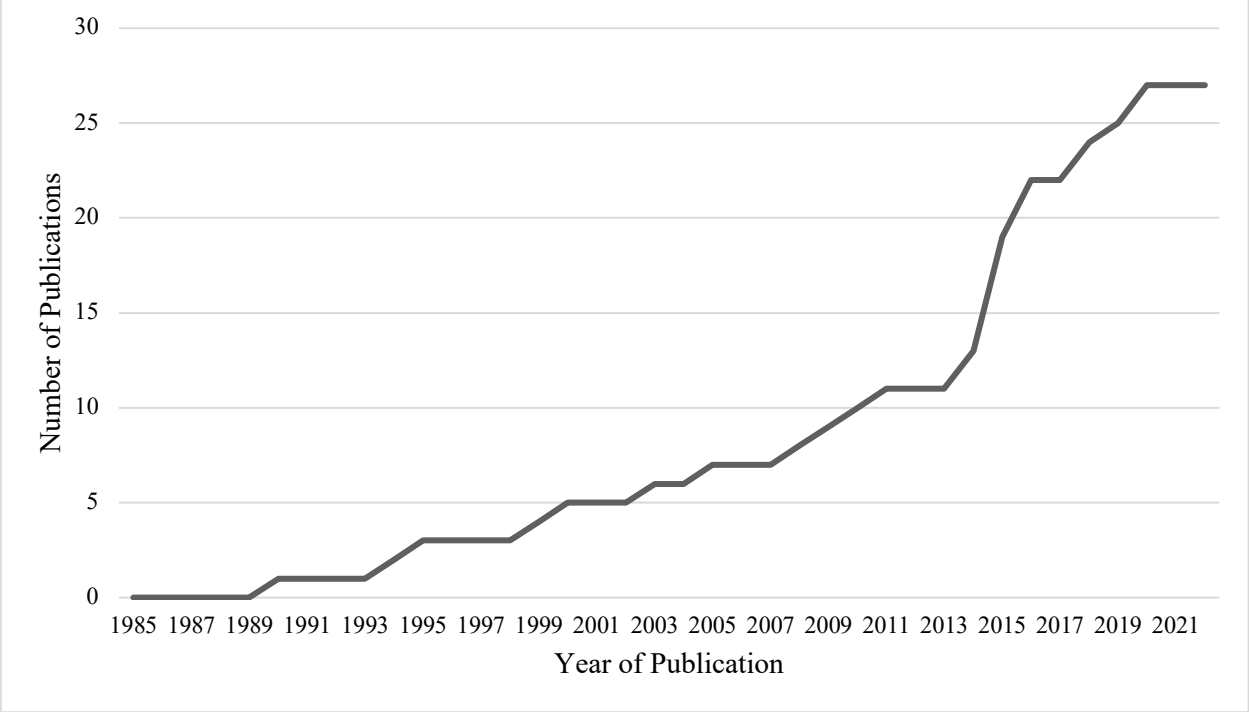
Table 2

All Articles Related to TBI in School Psychology Journals

Authors	Year	Journal Name	Article Type
Clark et al.	1990	*School Psychology International*	Empirical
Donders	1994	*Journal of School Psychology*	Empirical
Farmer & Peterson	1995	*School Psychology Review*	Nonempirical
Clark et al.	1999	*School Psychology Review*	Nonempirical
Arroyos-Jurado et al.	2000	*Journal of School Psychology*	Empirical
Gil	2003	*Journal of School Psychology*	Nonempirical
Calhoun & Dickerson Mayes	2005	*Psychology in the Schools*	Empirical
Gillette & Depompei	2008	*Psychology in the Schools*	Empirical
Lewandowski & Rieger	2009	*Journal of Applied School Psychology*	Nonempirical
Davies et al.	2010	*Journal of Applied School Psychology*	Empirical
Chesire et al.	2011	*Journal of Applied School Psychology*	Nonempirical
Davies & Ray	2014	*Contemporary School Psychology*	Empirical
Davies et al.	2014	*School Psychology Forum*	Nonempirical
Jantz et al.	2015	*Contemporary School Psychology*	Nonempirical
Bradley-Klug et al.	2015	*School Psychology Forum*	Nonempirical
Canto & Pierson	2015	*School Psychology Forum*	Nonempirical
Chesire et al.	2015	*School Psychology Forum*	Nonempirical
Davis et al.	2015	*School Psychology Forum*	Nonempirical
Smith & Canto	2015	*School Psychology Forum*	Empirical
Kramer & Davies	2016	*Contemporary School Psychology*	Empirical
La Spata et al.	2016	*Contemporary School Psychology*	Empirical
Davies	2016	*Psychology in the Schools*	Nonempirical
Davies & Tedesco	2018	*Contemporary School Psychology*	Empirical
Bernstein & Davies	2018	*School Psychology Forum*	Nonempirical
Noakes et al.	2019	*School Psychology*	Empirical
Davies	2020	*Journal of Applied School Psychology*	Empirical
Eftaxas & Canto	2020	*Journal of Applied School Psychology*	Empirical

Figure 1

Cumulative Number of TBI Articles in School Psychology Literature



Proportion of Empirical vs. Nonempirical TBI Articles

The second research question sought to determine what proportion of articles related to TBI is empirical versus nonempirical and what types of empirical articles are published? Of the 27 TBI-related articles coded, 14 (51.9%) articles were empirical, and 13 (48.1%) articles were nonempirical. Empirical articles were further coded into subcategories. Of the empirical articles, 50% applied an intervention and measured outcomes, 21.4% consisted of survey research, and 28.6% were classified as other types of research. Table 3 provides the number of empirical and nonempirical articles as well as the empirical subcategories coded from each journal.

Table 3

Article Types by Journal

Journal	Empirical Articles			Nonempirical Articles	Total related to TBI
	Intervention & Outcomes	Survey Types	Other Types		
Contemporary School Psychology	3	1	0	1	5
Journal of Applied School Psychology	1	2	0	2	5
Journal of School Psychology	0	0	2	1	3
Psychology in the Schools	1	0	1	1	3
School Psychology (Quarterly)	1	0	0	0	1
School Psychology Forum	0	0	1	6	7
School Psychology International	1	0	0	0	1
School Psychology Review	0	0	0	2	2
	7	3	4		
Total		14		13	27

Topics within TBI-Related Articles

The third research question examined how often are the topics of transition, testing, training, and recommendations included in articles related to TBI? Articles were coded as either including the topics or not, based on the criteria listed in Table 1. Each article could include multiple topics. Articles coded within this review ranged from including one to four of the topics. There were three articles that did not include any of those four topics. Of those three articles, two briefly mentioned all the topics but did not meet criteria for coding. The third article was a study conducted about transition with implications for training but did not meet the criteria listed in Table 1.

The bottom row of Table 4 provides the total number of articles across the eight journals that included transition, testing, training, and/or recommendations. Overall, testing and recommendations were included within the highest number of articles (i.e., 19 each). Testing was included relatively frequently within the journals of *Journal of Applied School Psychology*, *Journal of School Psychology*, *Psychology in the Schools*, and *School Psychology Forum*. Recommendations were included relatively frequently within *Contemporary School Psychology*, *Journal of Applied School Psychology*, and *School Psychology Forum*.

Table 4

The Inclusion of Transition, Testing, Training, and Recommendations in Articles Related to TBI by Journal

	Number of Articles			
Journal	Transition	Testing	Training	Recommendations
Contemporary School Psychology	0	1	2	4
Journal of Applied School Psychology	2	3	2	4
Journal of School Psychology	1	3	0	0
Psychology in the Schools	1	3	1	2
School Psychology (Quarterly)	0	1	0	1
School Psychology Forum	3	5	3	5
School Psychology International	0	1	0	1
School Psychology Review	1	2	0	2
Total	8	19	8	19

Discussion

The current study examined which school psychology journals have published articles about TBI and what the articles have focused on in relation to TBI to gather data about the frequency, types, and topics of TBI articles. The results of this systematic review found that over a 38-year period, there was an average of less than one article published per year amongst all eight school psychology journals combined. This finding highlights the discrepancy between the number of children impacted by TBI and the research within school psychology journals. School psychologists are held to professional standards provided by NASP and should be capable of providing direct and indirect school-based services to students with TBI, families of those with TBI, and teachers educating students with TBI. To carry out these services, school psychologists should be able to rely upon literature within the field to grow their knowledge and skills. The lack of literature related to TBI within school psychology journals provides minimal support for continued self-study or growth on the topic of TBI.

Furthermore, of the 27 articles reviewed, a little more than half were empirical articles with research conducted to measure student outcomes (e.g., socially, behaviorally, academically), assess intervention strategies and accommodations, evaluate the effectiveness of professional trainings, or compile data about perceptions of school-based supports. The remaining articles were nonempirical articles that discussed similar topics without conducting research. These articles relied upon previous research conducted to provide guidance for school psychologists when providing school-based supports. Articles discussed topics such as the impact of TBI on school functioning, identification and assessment for school-based supports, school reentry after obtaining a TBI, collaboration efforts between stakeholders, recommendations for interventions, and school psychologists' responsibilities.

To gather data in relation to the topics included within TBI-related articles, the 27 articles included in this review were examined for the following four topics: transition, testing, training, and recommendations. Findings from Smith and Canto (2015) revealed that these were frequent topics within TBI-related articles. This review intended to expand upon their findings by specifying inclusion criteria. The results of this review indicated that testing and recommendations were the most prevalent topics within TBI-related articles and were included in over two-thirds of the articles reviewed. Whereas the topics of transition and training were included in less than one-third of the articles reviewed.

Articles discussing testing included research conducted or discussion/explanation of psychological, neurological, and/or academic assessment(s) to assess, monitor, and/or determine placement options for children with TBI. Articles that included testing often emphasized the role of school psychologists in evaluating students' needs for school-based supports. Articles encouraged frequent monitoring and assessment due to the rate of behavioral, social, and academic changes that can occur with a TBI. The prevalence of testing within TBI-related articles is comparable to Smith and Canto's (2015) research who found that testing was the most frequently cited topic within TBI-related articles. The current results were expected due to school psychologists having a primary responsibility of testing students for special education services within an educational system. Given school psychologists have a major role in assessing students for special education services, the likelihood that journals would publish more information about this role compared to more minor roles is understandable.

One difference between current results and Smith and Canto (2015), however, is the finding that recommendations related to TBI are now included just as often as the topic of testing. Recommendations included guidance for school-based supports containing

accommodations, modifications, or interventions. Articles that included recommendations provided relevant guidance on teaching strategies (e.g., task analysis, multi-sensory learning, direct instruction), varied levels of intervention (e.g., social skills, self-management techniques, counseling), and accommodations (e.g., frequent breaks, extended deadlines, preferential seating, assistive technology). Another primary role of school psychologists is consulting with educators about student supports. Thus, the primary role of consulting is consistent with the frequent number of publications on recommendations. The high frequency of articles including recommendations could also be due to the nature of academic publications in which authors provide recommendations for practical use and/or continued research.

Limitations

This review looked at eight school psychology journals to locate TBI-related articles. Due to the medical impact of TBI, it is possible that school psychologists are seeking information elsewhere to support their students with TBI such as medical journals or medical resources. Books related to TBI might also be used as guidance in the field; however, this review did not include books and it is unknown the extent book publications written for educators focus on TBI.

In addition, the initial search terms could have limited the number of articles located for this review. Additional articles might have been located if there had been various terms related to TBI used in the search (e.g., concussion, acquired brain injury).

Implications

Smith and Canto (2015) found 17 articles related to TBI in a 30-year period within all eight school psychology journals. Unlike the current methodology, those 17 articles included book reviews and articles that merely mentioned TBI, but TBI was not the focus of the article

(e.g., neuropsychological assessment). This review found 14 TBI-related articles in the last eight years within those same eight school psychology journals even after excluding some types of articles they included (e.g., book reviews). Thus, school psychology journals have been publishing more TBI-related articles over the past decade, indicating an increased emphasis on TBI in the field of school psychology or a reflection of the expansion of school psychologists' roles within school systems. School psychologists are becoming more involved with various areas of student supports rather than just assessing for special education services. However, in the past two years there have not been any TBI-related articles published within the eight school psychology journals. If this trend continues, there will be a plateau of TBI-related publications in the school psychology field.

It should be noted, however, that about one third of the articles published in the past eight years were part of a special issue of *School Psychology Forum* that focused on the topic of TBI. Thus, the increase in TBI publications in the past eight years, while providing valuable information to school psychologists, could be considered artificially inflated. Based on the long-term trend, it would be expected that the proportion of TBI-related articles would not increase to that extent again without another special issue focused on TBI in one of the journals.

Another factor to consider is that about three-fifths of the 27 articles reviewed contained at least one author that was associated with another publication included in this review. This indicates that a small number of authors are focusing on TBI in the field of school psychology. An increase in information about TBI is occurring due to the increased number of publications but there may be a lack of interest across the field due to few authors publishing on TBI.

To continue growth on the topic of TBI within the school psychology profession, an increase of publications related to all topics previously discussed would add an influx of

information for school-based services. This includes guidance for professional training to promote self-efficacy, protocols for transitions back to school after an injury, adapting student supports, and monitoring student success.

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APPENDIX A

List of School Psychology Articles Reviewed

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