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The Masgutova Neurosensorimotor Reflex Integration (MNRI®): A Scoping Review

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The Masgutova Neurosensorimotor Reflex Integration (MNRI®): A Scoping Review

Abstract

Background. The Masgutova Neurosensorimotor Reflex Integration (MNRI®) method emerged from Russia in the 1990s as an intervention to improve maturation, development, and functional abilities for a variety of clients. MNRI® has since become an emerging intervention in occupational therapy in the US, particularly with pediatric clients. The evidence supporting use of MNRI® remains limited.

Method. Using updates by Levac and colleagues (2010) to the Arksey and O'Malley (2005) process for scoping review, databases and the MNRI®website were searched. Fourteen unique articles were identified and reviewed. Articles were categorized by common characteristics and reviewed for gaps in the literature.

Results. A paucity of literature was found on the MNRI® method. Studies included varying lower levels of evidence and research conducted by the developer of the program or affiliates of the MNRI® organization. Characteristics of the MNRI® method were noted to align with the criteria defining controversial practices.

Discussion. Research regarding the MNRI® needs to be conducted by individuals beyond that of Masgutova and her affiliates. Future studies would benefit from comparing MNRI® to other interventions classified as gold standard treatment modalities; conducting research of greater rigor; and establish strong psychometric properties for outcome measures used by MNRI® therapists.

Keywords

Masgutova neurosensorimotor reflex integration, MNRI, reflexes, pediatrics

Cover Page Footnote

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Credentials Display

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The advent of emerging occupational therapy interventions offers the clinical researcher the opportunity to explore the efficacy of use in practice (Lee et al., 2017; Schaaf et al., 2018). One such emerging intervention is the Masgutova Neurosensorimotor Reflex Integration (MNRI®) method developed by Dr. Svetlana Masgutova (Svetlana Masgutova Educational Institute, [SMEI] 2019a). This approach has become increasingly available in pediatric practice because of strong testimonials from clinicians and parents following the implementation of the MNRI® method (SMEI, 2019b). Although clinicians and parents of pediatric clients report positive testimonials related to the outcomes of the MNRI® method (SMEI, 2019b), there is a paucity of literature exploring the efficacy of this approach. This scoping review explores the current state of evidence related to MNRI® and provides suggestions for future research related to the intervention.

Background

The challenge of persisting primitive reflexes has been a focus of pediatric occupational and physical therapy clinicians for decades (Stallings-Sahler et al., 2019). A variety of intervention approaches (e.g., neurodevelopmental therapy [NDT], sensory, the Doman-Delacato method, etc.) have been used to integrate or manage the influence of the reflex and promote effective movement patterns and, thus, participation in meaningful life functions (Stallings-Sahler et al., 2019). Yet, in some pediatric clients, the primitive reflexes have persisted, impeding developmental progression and participation in preferred life occupations (Stallings-Sahler et al., 2019). A recent emerging approach, the MNRI® method, suggests a means toward reflex integration (SMEI, 2019a). The developers of the method propose that through the use of MNRI®, reflex integration in pediatric clients occurs, improving overall general function and attainment of one's full potential (SMEI, 2019a). Yet, the literature supporting the process and use of the method for this population remains limited. Providing therapists with a brief background of and current literature related to the method will assist in discerning efficacious application in practice.

MNRI® in Practice

The official website for SMEI and MNRI® suggests that the Masgutova Method® uses reflex integration through select MNRI® programs to restore and mature primary motor patterns and primitive reflexes that subsequently promote improved coordination and general life functions (2019a). It has also intimated that a resulting outcome is overall improved brain functioning and sensory-motor integration. Through the SMEI (2019a) website, it has been suggested that following the Masgutova Method®, reflex patterns are activated, promoting effective reflex integration that, in turn, permits improved functional movement and sensory regulation. The stated over-arching outcome of this intervention suggests the client is enabled to reach their functional potential effectively.

To achieve this realization, the MNRI® method includes an initial assessment performed in the first session by an MNRI® certified assessment specialist to establish a baseline for the level of reflex maturity the client is demonstrating (Masgutova, 2012; SMEI, 2019a). From this baseline, clinical judgement is used to initiate a treatment plan to integrate persisting reflexes (SMEI, 2019a). An MNRI® family educational conference conducted by SMEI also provides an opportunity for children to receive intensive MNRI® treatment by experts and professionals trained on the method (SMEI, 2019a). The conferences range from 4 to 8 days, with children receiving about 6 hr of treatment a day (SMEI, 2019a). During the conference, the developer of the approach, or a certified assessment professional, evaluates the functionality of the participant's reflexes. Findings from the MNRI® Reflex assessment (Masgutova et al., 2016b), along with clinical judgement, determine which reflex protocols should be used with each child. Masgutova (2012) listed 19 protocols to use dependent on the outcome of the MNRI® Reflex assessment

(Masgutova et al., 2016b). Each protocol consists of a variety of reflex patterns, such as the Babinski reflex or leg cross flexion-extension reflex, that is stimulated to promote effective reintegration and eventual functional skill attainment, in this case, upright standing and walking. Once the protocols have been identified, the child receives the MNRI® treatment by a core specialist (a clinician who has attained all MNRI® competencies) who then provides parent and caregiver education and a home program (SMEI, 2019a). MNRI® family educational conferences require a large financial commitment (e.g., $4,800 to $10,850), depending on the location of the conference and participant age. Thus, families may choose to attend the MNRI® family educational conference or find a local therapist who specializes in the MNRI® method to obtain an evaluation and intervention services.

Effective Solutions in Pediatric Practice

There has been a focus in occupational therapy on evidence-based practice (EBP) to critically appraise evidence supporting effective solutions and increase the relevance of the profession in the medical field (Illott et al., 2006). The American Occupational Therapy Association's (AOTA) *Vision 2025* statement promoted effective solutions, stating, "Occupational therapy maximizes health, well-being, and quality of life for all people, populations, and communities through effective solutions that facilitate participation in everyday living" (2017, p. 1). This vision suggests the continued use of EBP standards and guidelines as paramount to defining effective interventions as solutions and justifies their use in practice. By implementing EBP standards to emerging interventions, there remains potential for them to be considered controversial because of the rigors of EBP. In the past, a challenge existed for novel emerging practices, with skepticism often shrouding the approach, deeming it controversial until fully supported by research (Jacobson et al., 2005; McWilliam, 1999; Nickel, 1996).

Controversial Therapies Defined

Researchers have defined controversial therapies and the criteria that consider an intervention as such (Jacobson et al., 2005; McWilliam,1999; Nickel, 1996). Nickel (1996) acknowledged that controversial interventions cannot be primarily based on support from research and suggested that for an intervention to be labeled controversial, it should include the following criteria:

- it must be claimed to only be effective for a variety of conditions
- the therapy must claim most children will respond dramatically and might even be cured
- interventions are supported by case reports and not by designed research trials
- interventions are not defined by specific objectives, such as a positive response documented on Day 1, and 6 months later is claimed as proof of the positive effect
- interventions are stated to have no side effects.

In addition, McWilliam (1999) suggested that an intervention is considered controversial if it claims to cure a diagnosis or disorder, the therapist must have a specialized degree or certification to practice the approach, there is limited or no research related to treatment effectiveness, there is a requirement that the intervention be conducted at a high-intensity or frequency level, and legal action has been reported against the approach. McWilliam and Nickel suggested that these criteria be considered whenever analyzing the efficacy of an emerging intervention approach.

An example of an intervention approach considered controversial yet still implemented by occupational therapists is the Ayres Sensory Integration ([ASI®]; Ayres, 1989) approach (McWilliam, 1999; Novak, 2012). McWilliam explained that up until 1999, ASI® was an accepted practice by professionals and parents, despite the lack of empirical evidence to support its effectiveness. Since the

publication of McWilliam's (1999) article, extensive research and systematic reviews have been conducted on ASI® (Schaaf et al., 2018; Watling & Hauer, 2015) and fidelity measures established (Parham et al., 2011). Two systematic reviews evaluated the level of evidence provided on ASI® techniques. Watling and Hauer (2015) identified that the emerging evidence for ASI® supported the need for the intervention to be individually implemented to promote strong effectiveness. Watling and Hauer further explained the current status of evidence on ASI® was not strong; however, the intervention was still in the early stages of research because of the wide variability in how it was implemented. As well, the authors noted that no study replications were reported. Thus, Watling and Hauer suggested using caution when drawing conclusions on ASI® intervention effectiveness. Whereas in a 2018 systematic review strong evidence supporting the efficacy of ASI® as an intervention approach was reported, with the authors suggesting it should be included in occupational therapy practice (Schaaf et al., 2018). This may have been a result of the established ASI® fidelity measures used in relation to research (Parham et al., 2011). Schaaf et al. (2018) based their decision on the level of evidence via GRADE, a scale based on guidelines from the U.S. Preventive Services Task Force (U.S. Preventive Services Task Force, 2018). This included classifying the evidence as strong, moderate, or weak. The authors used outcome measures with strong psychometric properties to identify improvement in functional daily activities rather than measuring skill-based outcomes, such as motor performance, academic skills, or sensory processing (Schaaf et al., 2018). While ASI® remains controversial, it continues to remain a common practice used by occupational therapists regardless of the contradictions in the outcomes related to the intervention (Novak, 2012).

MNRI® as Controversial. When the established criteria (McWilliam, 1999; Nickel, 1996) was applied to MNRI®, the method fell into question as to whether it should be deemed a controversial method. MNRI® was associated with the following criteria set by McWilliam (1999) and Nickel (1996): evidence type (Nickel, 1996), where implementation of the method is mainly supported by case reports and testimonials rather than well-designed research trials; requirement of practitioner specialization (McWilliam, 1999), where therapists with a specialized degree, such as occupational therapists, are required to have additional education to practice MNRI® (becoming a core specialist requiring extensive training and financial commitment); high-intensity requirement (McWilliam, 1999), where family education conference requiring intervention 6 hr a day for 4 to 8 days with a high cost.

The increased interest in MNRI® as a pediatric intervention, in conjunction with the number of criteria met indicating the potential of the intervention to be considered controversial (McWilliam, 1999; Nickel, 1996), warranted an exploration of the literature regarding the efficacy of the approach. Such an understanding may clearly assist in the determination of MNRI® use and approach in pediatric practice. Thus, the purpose of this study was to respond to the research question, What is the evidence in relation to the use of MNRI® as a therapeutic intervention?

Method

A scoping review methodology was selected to explore the current evidence, map the main concepts that support the approach, and identify gaps in the literature. This scoping review, conducted in 2019, was guided by the process identified by Levac et al. (2010) in relation to the 5-step method of Arksey and O'Malley (2005) to thoroughly explore the literature related to this emerging intervention. The process included identifying the research question, identifying relevant studies, creating a study selection, collecting data, and summarizing the report results. This method provided a framework to evaluate literature in a broader context that included all types of studies.

Identifying Relevant Studies

The databases used included EBSCOHOST, PROQUEST, OTseeker, PUBMED, and TRIP. EBSCOHOST also included the databases CINAHL, MEDLINE, PsycINFO, and Google Scholar. In addition, articles found on the SMEI website were included in the search 2019c). The following search terms were used: "MNRI," "Masgutova Neurosensorimotor Reflex Integration," "Masgutova method," and "Masgutova Neurosensorimotor Reflex Integration and MNRI."

The inclusion criteria included the terms, abbreviations, or content in the title, abstract, or article; written in English; published in scholarly or open-access journals; obtained in full text; and published between 1980 and 2018. Articles that did not meet the inclusion criteria were discarded. Thus, newspaper articles, informational handouts, editorials, theses, and testimonials accessed through the MNRI® website or online databases were discarded. The reviewers were randomly assigned two or three databases to review the search term results and apply inclusion criteria to each article. Inter-reviewer reliability for inclusion criteria was established at 80% agreement.

From the selected databases, 3,863 results were identified (see Figure 1). An additional 107 results were identified from the MNRI® website yielding 3,970 results in the initial search. Google Scholar produced 3,450 results for the search term "MNRI," which were discarded from the study because parts of the acronym were used in literature for content other than the MNRI® method (e.g., MRI). This led to 520 articles being reviewed for the inclusion criteria. Following the first review, 306 articles were discarded for not meeting the inclusion criteria, leaving 214 articles. A more in-depth application of the inclusion criteria resulted in an additional 168 articles discarded, leaving 46 articles. Duplicates (n = 32) were then discarded, yielding 14 unique articles for the scoping review. These 14 articles were subjected to a full-text review. The references of the 14 articles selected for this scoping review were scanned to identify any additional articles on MNRI®. This review only produced duplicates of articles that had already been identified.

Collecting the Data

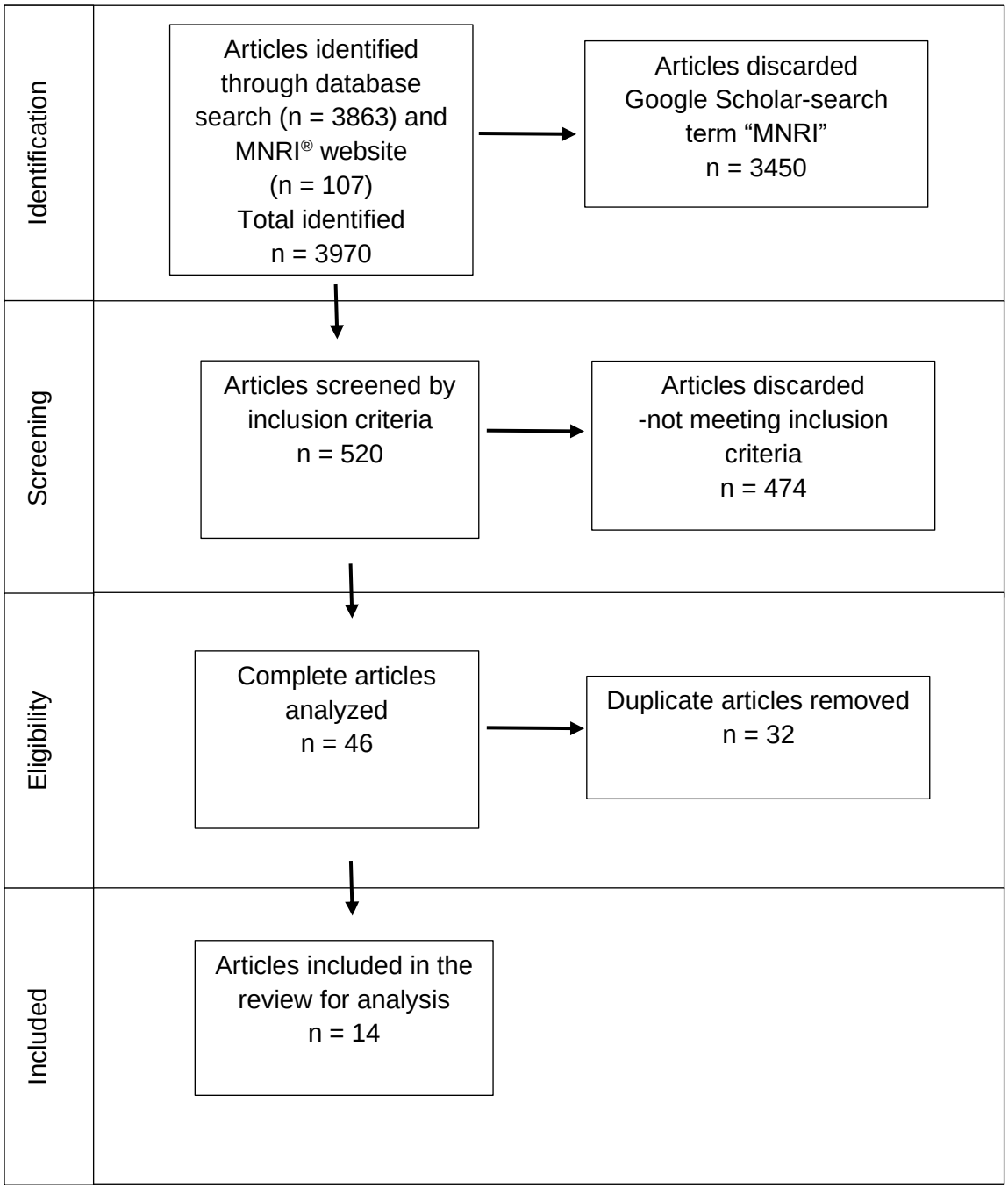
An Excel© spreadsheet was used to document key content and themes from each of the 14 articles. This included the title, author, population, diagnosis, outcome measures, functional outcomes, and evidence level (see Appendix).

Results

Articles were reviewed in relation to the level of evidence, population and age range, diagnosis, MNRI® protocols, outcome measures used, and reported functional outcomes (see Appendix). Of the 14 articles, two were from peer-reviewed sources, and 12 were from open-access journals. One peer-reviewed source was from Poland but was written in English (Pilecki et al., 2012). The second source was a compilation of open-access and peer-reviewed articles (Masgutova, 2016). Ten out of the 14 articles included the developer of the method as an author and/or researcher (Akhmatova et al., 2015; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2017; Masgutova et al., 2018; Pilecki et al., 2012; Shackleford et al., 2017). The remaining four articles (Akhmatova & Akhmatova, 2017; Koberda et al., 2016; Nowak & Sendrowski, 2017; Renard-Fontaine, 2017) were written by MNRI® core specialists or people affiliated with the Masgutova research team.

Figure 1

Process for Selecting Articles for Scoping Review



Note. Figure from PRISMA 2009 (Moher et al., 2009). Articles obtained from scholarly databases (EBSCOHOST [included CINAHL, MEDLINE, PSYCinfo, GOOGLE SCHOLAR], PROQUEST, OTseeker, PUBMED, TRIP) and the MNRI® website. All literature screened for inclusion of search terms in the title, abstract, or article then reviewed for inclusion criteria.

Population and Age Range

Twelve of the 14 articles included a primary focus on children ages 0 to 19 years (Akhmatova & Akhmatova, 2017; Akhmatova et al., 2015; Koberda et al., 2016; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2018; Pilecki et al., 2012; Renard-Fontaine, 2017; Shackleford et al., 2017). Masgutova et al. (2017) studied a group of adults 32 to 54 years of age. Nowak and Sendrowski (2017)

provided an expert opinion analysis of the MNRI® tactile integration protocol but did not involve a study group. Of the 12 studies that used the MNRI® intervention with children (Akhmatova & Akhmatova, 2017; Akhmatova et al., 2015; Koberda et al., 2016; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2018; Pilecki et al., 2012; Renard-Fontaine, 2017; Shackleford et al., 2017), four studies involved child participants 10 years of age or younger (Akhmatova & Akhmatova, 2017; Masgutova et al., 2018; Pilecki et al., 2012; Renard-Fontaine, 2017). However, Shackleford et al. (2017) investigated both children and adult participants with no age specified.

Diagnosis of Participants Served

The pediatric diagnoses included in the studies ranged from neurological conditions of autism spectrum disorder (ASD), cerebral palsy (CP), and other neurological disorders to genetic disorders or syndromes (Akhmatova & Akhmatova, 2017; Koberda et al., 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2018; Pilecki et al., 2012), and exposure to traumatic events (Masgutova, 2016; Shackleford et al., 2017). Ten of the 12 studies that involved a pediatric population included: Down syndrome (n = 3) (Akhmatova & Akhmatova, 2017; Masgutova, Akhmatova, et al., 2016; Masgutova, Sadowska, et al., 2016); autism spectrum disorder (n = 2) (Masgutova, Akhmatova, et al., 2016a; Masgutova et al., 2018); cerebral palsy (n = 1) (Pilecki et al., 2012); amniotic band syndrome (n = 1) (Renard-Fontaine, 2017), varied neurological disorders (e.g., traumatic brain injury, hyperactivity disorder) (n = 2) (Koberda et al., 2016; Nowak & Sendrowski, 2017), and recurrent obstructive bronchitis (n = 1) (Ahkmatova et al., 2015). Two of the 12 studies conducted on pediatric populations included children involved in traumatic incidents related to the Baton Rouge and Lafayette flooding in Louisiana (Shackleford et al., 2017) and the shooting at Sandy-Hook Elementary School in Newtown, Connecticut (Masgutova, 2016). One of the 14 studies focused solely on adults who reported no specific diagnosis (Masgutova et al., 2017) but held high-level employment positions (e.g., business manager or director) for 3 to 10 years.

MNRI® Protocols

A wide variety of reflex protocols (e.g., MNRI® Trauma Recovery Protocol; MNRI® tactile neuro-integration) were identified with some noted consistency of protocols used. Of the 14 articles, six implemented a tactile neuro-integration protocol (Akhmatova et al., 2015; Koberda et al., 2016 Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Nowak & Sendrowski, 2017). Of those six, one article was an analysis regarding neurophysiological aspects of NeuroTactile therapy (Nowak & Sendrowski, 2017). Two out of the 14 articles (Masgutova, 2016; Shackleford et al., 2017) used the MNRI® Trauma Recovery Protocol as described in Masgutova, Akhmatova, et al. (2016) and Masgutova et al. (2016a). Comparison of protocols used between studies was difficult to discern because of inconsistent use of intervention protocols across studies.

Outcome Measure Used

Eleven out of the 14 articles (Akhmatova & Akhmatova, 2017; Koberda et al., 2016; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2017; Renard-Fontaine, 2017; Shackleford et al., 2017) reported improvements in MNRI® Reflex assessment (Masgutova et al., 2016b) scores after receiving various MNRI® protocols. The MNRI® Reflex assessment (Masgutova et al., 2016b) describes the functioning of a reflex circuit according to five parameters, including: (a) sensory perception, processing of sensory stimulus in the central nervous system and motor response (the individual reactions for specific stimuli);

(b) latency (time of response after the stimulus); (c) direction of the response of the reflex pattern; (d) strength/intensity of response; and (e) locomotor or positional symmetry (Masgutova et al., 2016b). The psychometric properties of the MNRI® Reflex assessment were not reported (Masgutova et al., 2016b).

Stress Response

Ten of the 14 articles referred to or measured stress (Akhmatova et al., 2015; Koberda et al., 2016; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova et al., 2017; Masgutova et al., 2018; Nowak & Sendrowski, 2017; Shackleford et al., 2017); however, it was inconsistently measured (e.g., blood plasma cortisol levels) across studies. Two articles briefly mentioned the effects of MNRI® on stress resilience but did not mention it being measured in the studies (Akhmatova et al., 2015; Masgutova, Akhmatova, et al., 2016). Masgutova et al. (2018) included information on the negative impact of stress on the progression of MNRI® treatment. In the abstract, Nowak and Sendrowski (2017) discussed a reduction of stress as a neurophysiological aspect of NeuroTactile therapy using MNRI®, but any research related to this was not reported.

Six of the 14 articles (Koberda et al., 2016; Masgutova, 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova et al., 2017; Shackleford et al., 2017) measured stress resilience to determine if MNRI® stabilizes the activation of the reticular activating system. When the reticular activating system was lowered, it was reported to support the neurophysiological and neuropsychological aspects of personality growth, with the report of optimized overall well-being in multiple life areas.

Two articles focused on extreme traumatic events: the Newtown, Connecticut shooting (Masgutova, 2016) and the Louisiana flood (Shackleford et al., 2017). Both articles measured stress and referred to the functional outcomes of decreasing stress in the participants' daily lives by using the stress vulnerability/resilience section of the Questionnaire of Dynamic Changes in Children's Abilities (Masgutova, 2016; Shackleford et al., 2017). In three of the articles, positive results were found when comparing the pre- and post-test scores of the stress vulnerability/resilience section of the Questionnaire of Dynamic Changes in Children's Abilities (Masgutova, Akhmatova, et al., 2016b). However, the authors of the articles did not make any further connections regarding the impact on the participants' daily lives (Koberda et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b).

Reported Functional Outcome

Four of the 14 studies indicated improvements in functional outcomes based on the Questionnaire of Dynamic Changes in Children's Abilities (Koberda et al., 2016; Masgutova, 2016; Masgutova et al., 2016a; Masgutova et al., 2016b), a tool developed by Dr. Masgutova. This questionnaire contains 10 different areas of functioning and daily life activities of children that are self-reported by caregivers and MNRI® specialists working with the children, including: (a) sensory-motor coordination and integration, (b) behavior regulation and self-protection, (c) emotional regulation, (d) self-awareness, (e) sociability and interaction, (f) stress vulnerability/resilience, (g) physical health, (h) speech and language, (i) cognitive processes and learning, and (j) motivation for achievement and learning (Masgutova et al., 2016b). The functional improvements of participants were measured before and after receiving treatment (Koberda et al., 2016; Masgutova, 2016; Masgutova et al., 2016a; Masgutova et al., 2016b). The psychometric properties of the Questionnaire of Dynamic Changes in Children's Abilities (Masgutova et al., 2016b) were not reported.

Four of the 14 articles (Akhmatova & Akhmatova, 2017; Akhmatova et al., 2015; Koberda et al., 2016; Pilecki et al., 2012) used other outcome measures. Two of these articles examined blood samples (Akhmatova & Akhmatova, 2017; Akhmatova et al., 2015), one specifically looked at levels of T-

lymphocytes, B-lymphocytes, NK-cells, immunoglobulin, and pro and anti-inflammatory cytokines (Akhmatova & Akhmatova, 2017). The other article (Akhmatova et al., 2015) looked at neutrophil phagocytosis activity, sub-populations of lymphocytes, blood plasma cortisol levels, cytokine levels in peripheral blood mononuclear leukocytes, and nitro blue tetrazolium levels. Neither of these studies reported a functional outcome in relation to the intervention. The study by Pilecki et al. (2012) used brainstem auditory evoked potentials, specifically examining the interpeak latency I-V values. Again, no functional outcome was reported by Pilecki et al. The fourth study (Koberda et al., 2016) used brain mapping, specifically quantitative EEG to examine brain map changes before and after receiving MNRI® treatment. Koberda et al. (2016) reported functional outcomes, including: improved balance, postural control, and motor planning; improved memorizing and language skill development; and improved sensory motor integration and emotional regulation. However, it was unclear how Koberda et al. measured these functional outcomes other than by client self-report.

Discussion

This scoping review provided a synthesis of the extent of the literature regarding the MNRI® method. Fourteen unique articles were identified that discussed the MNRI® method. All 14 articles investigated the effectiveness of MNRI® using a variety of MNRI® specific protocols based on clinical judgement in relation to assessment results to determine treatment. Thirteen of the 14 articles (Akhmatova & Akhmatova, 2017; Akhmatova et al., 2015; Koberda et al., 2016; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016a; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2017; Masgutova et al., 2018; Pilecki et al., 2012; Renard-Fontaine, 2017; Shackleford et al., 2017) reported positive outcomes after implementation of various MNRI® protocols. However, 11 of these 13 articles (Akhmatova & Akhmatova, 2017; Akhmatova et al., 2015; Koberda et al., 2016; Masgutova, 2016; Masgutova, Akhmatova, et al., 2016; Masgutova et al., 2016b; Masgutova, Sadowska, et al., 2016; Masgutova et al., 2017; Masgutova et al., 2018; Pilecki et al., 2012; Renard-Fontaine, 2017) used different MNRI® protocols during interventions, making it difficult to ascertain comparisons across studies. The Nowak and Sendrowski (2017) article was not a research article but rather an explanation of the MNRI® NeuroTactile therapy protocol. Stress was a common theme found throughout the articles regarding the impact on reflexes and the effect MNRI® had in relation to stress resilience. However, the articles varied in the amount of stress components included, making it difficult to analyze conclusions on the effects of MNRI® on participation in daily functions.

The paucity of articles on the MNRI® method, in conjunction with the majority authored by Masgutova or affiliates of the SMEI, constitutes the need for further research from outside sources. Considering the criteria stated by McWilliam (1999) and Nickel (1996), the MNRI® method may be deemed controversial. The method fell in line with the criteria of significant financial implication (cost to service providers to gain certification as a core specialist and cost to families for extensive intervention sessions) as well as a paucity of research, including replication studies comparing a gold standard intervention to MNRI®.

Reliance on Testimonials

Challenges occurred in comprehending and understanding content in the articles, especially those related to stress response (Akhmatova et al., 2015 & Koberda et al., 2016), because of a lack of detail and unclear methodology. Throughout the scoping review, it was noted that the articles lacked consistent themes with no study replications reported. This may be because of the focus on the core specialist using clinical judgement to determine which protocols to implement with each child. As well, it was unclear if

the study authors included the needs and requests of the participants in conjunction with the best available evidence when considering use of MNRI® as an optimal therapeutic intervention. The over-reliance on testimonials in the articles suggests limited empirical evidence to support the use of the intervention in practice. Thus, use of the intervention should be pursued with caution.

Outcome Measures

A majority of the articles reported use of the MNRI® Reflex assessment (Masgutova et al., 2016b) and the Questionnaire of Dynamic Changes in Children's Abilities (Masgutova et al., 2016b) to measure improvements in reflex scores before and after receiving interventions. The Questionnaire of Dynamic Changes in Children's Abilities (Masgutova et al., 2016b) is based on observations and reports from the MNRI® core specialist and caregivers of the client. Thus, it was unknown if normative data were reported in other studies or how the effectiveness of the selected interventions were evaluated. A significant flaw of these measures is the lack of reliability and validity information. Without reported psychometric properties of these outcome measures, it is difficult to assess the efficacy of the intervention.

Population

A commonality in the population studied arose when reviewing the studies. Some studies included large populations. On careful review, it was discovered that there was a very large sample of typically developing children in the control group, yet the sample size for the experimental group was much smaller. This may mislead readers into believing there was a large study population equally distributed between typical and atypical participants. It should be noted that some large numbers in the articles only pertained to the control group of typically developing children. In addition, among the research studies that were analyzed, there was a commonality that the children receiving MNRI® treatment were compared to children both atypical and typical that did not receive any type of treatment. This falls within the criteria of a controversial therapy stated by McWilliam (1999) that the research is not being compared to a group receiving a different intervention that has been previously established and well researched to be effective.

Financial Implications

A consideration of the MNRI® method is the large financial commitment that must be made to obtain training for the therapists. Most MNRI® courses cost about $300 to $800, depending on the required hours to complete the course (SMEI, 2019a). According to McWilliam (1999), this financial commitment would qualify as a characteristic of controversial practice. Further, the requirements of attendance for families at a family education conference and the intensity of the therapy being conducted may come at a high cost to participants. The implications of the intense therapy at these conferences will inherently increase the cost of the intervention for parents to bring their children to these sessions. This falls in conjunction with the criteria related to financial costs shared by McWilliam.

Clinical Judgment

After an initial evaluation is completed on an individual beginning MNRI® treatment at a clinic or family education conference, clinical judgement is used to delineate which reflex protocols should be implemented. The reflex protocols are uniquely tailored to the individual depending on their needs, current reflex patterns, and functional abilities. This reflects the reasoning for using various reflex protocols throughout the studies.

Considering the fidelity measures, such as those used for research related to ASI® (Parham et al., 2011), it would be prudent for the researchers of the MNRI® method to establish fidelity measures as well. The development of strong research fidelity measures and standardized outcome measures with strong psychometric properties would promote reliance on consistent tools rather than an over reliance on

testimonials to support continued use of the intervention. Until these two specific suggestions have been incorporated, the use of the MNRI® method in practice must be done with caution.

Examination of the current literature identified a variety of consistencies in the research that must be considered when deciphering the level of support and use of the MNRI® method. There remains a paucity of research on the MNRI® method, with those identified lacking in rigor. This was further supported by the procedures and implications highlighted in the studies, including a lack of randomized controlled studies, large populations for control groups compared to study groups, a lack of psychometrics validating outcome measures, a majority of population data gathered from family conferences, and a lack of comparison between the MNRI® method and other interventions. A majority of the research was conducted by the developer of the program and MNRI® core specialists who use clinical judgement to select the most effective reflex protocol for each client. Although clinical judgement is a valuable aspect of practice, it makes it difficult to replicate the reflex protocols being used across studies or in specific population groups. Thus, it is difficult to identify the benefits and effectiveness of using the MNRI® method among different populations.

Limitations

A variety of limitations were experienced while conducting this scoping review. The authors only had access to United States databases for research articles and only those articles written in English. The quantity and depth of the articles identified for this scoping review may have been limited, especially considering the MNRI® method was both created and researched in Russia. The exclusion of articles that were not published in scholarly or peer-reviewed open-access journals may have inadvertently eliminated some articles. While this may have enhanced the rigor of the scoping review, it excluded information and outcomes provided through testimonials, poster presentation summaries, and unpublished case studies.

Conclusion

The purpose of this scoping review was to explore the current literature regarding MNRI® as an intervention. The evidence in relation to the use of MNRI® as a therapeutic intervention is limited because of a lack of rigorous studies in the literature and nearly all studies having a connection to the developer of the program. There is a paucity of high-level studies supporting the implementation and effectiveness of the MNRI® method; therefore, more effective means of supporting clinical judgement from highly skilled therapists may need to be developed to support the use of MNRI® in practice. Gaps in the literature were identified in relation to MNRI®, including but not limited to the lack of using a series of case studies as retroactive reviews in relation to clinical judgement with a variety of populations, no randomized controlled study implementing the MNRI® method, no research conducted by individuals unaffiliated with SMEI, no psychometric properties reported in relation to the MNRI® Reflex assessment (Masgutova et al., 2016b) or the Questionnaire of Dynamic Changes in Children's Abilities (Masgutova et al., 2016b), and no fidelity measures reported for use of the approach in practice or research studies. The issues noted above are significant flaws in the research that impact the ability to assess the efficacy of the intervention effectively. Thus, noting the criteria of McWilliam (1999), the MNRI® method would be considered controversial and, therefore, should be used with caution. To promote a shift from controversial practice to EBP, higher levels of research need to be completed on the MNRI® method.

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Appendix

Studies Included in the Scoping Review (N = 14)

AUTHORS	DIAGNOSIS	POPULATION	N	REFLEX PROTOCOL	OUTCOME MEASURE	FUNCTIONAL OUTCOMES	EVIDENCE LEVEL
Akhmatova & Akhmatova (2017)	Down syndrome	Ages: 0–6 years, male & female	N = 105 Typical n = 56 & Atypicaln = 49	MNRI® neurosensorimotor reflex integration	Levels of immune status and dynamics of lymphocytes subpopulations, immunoglobins and cytokines; psychometric evaluation of anxiety; MNRI® reflex assessment	None specified	2B
Akhmatova et al. (2015)	Recurrent obstructive bronchitis	Ages: 2–13 years, male & female	N = 75 Typical n = 15 & Atypicaln = 60	Neurostructural reflex integration; tactile-neuro integration; reflex repatterning; breathing reflex; and visual and auditory reflexes integration	Neutrophil phagocytosis activity, sub-populations of lymphocytes, blood plasma cortisol level, cytokine levels in peripheral blood mononuclear leukocytes, and nitro blue tetrazolium level	None specified	2B
Koberda et al. (2016)	Autism spectrum disorder (ASD), cerebral palsy, traumatic brain injury, attention deficit and hyperactivity disorder (ADHD), stroke, dystonia, and post-traumatic stress disorder (PTSD)	Ages: 2–47 years, gender not specified	N = 53 Atypicaln = 53	Reflex repatterning; proprioceptive-cognitive integration; neuro-structural reflex integration; tactile-neural integration; breathing reflex integration; oral-motor visual and auditory reflexes integration; archetype movement integration; stress and traumatic stress release	MNRI® reflex assessment, Questionnaire of Dynamic Changes of Children's Abilities, and Brain mapping	Improved balance, postural control & motor planning; improved focusing, memorizing, & language development; Improved sensory-motor integration, behavior & emotional regulation, communication, stress resilience, overall physical health, and academic achievement	4
Masgutova (2016)	x	Individuals exposed to the traumatic events	N = 1,204 Typicaln	MNRI® trauma recovery protocol	MNRI® reflex assessment and Questionnaire of	Positve changes in stress resilience, behavioral regulation, & cognitive	2B

		of the shooting at Sandy Hook in Newtown, ages 2–19 years.	= 730 & Atypicaln = 474		Dynamic Changes in Children's Abilities	function; Improvement in all 10 areas of the Questionnaire of Dynamic Changes in Children's Abilities	
Masgutova, Akhmatova et al. (2016)	Down syndrome	Ages: 6 months–18 years, male & female	N = 874 Typical n = 780 & Atypicaln = 94	Neuro- structural reflex integration; tactile-neural reflex integration; dynamic & postural reflex pattern integration; lifelong reflex integration; proprioceptive & cognitive integration; visual & auditory reflex integration; oral-facial reflex integration; archetype movement integration	MNRI® reflex assessment	Improved fine motor skills; speech and communication, and overall motivation toward learning; decreased issues related to behavior	2B
Masgutova et al. (2018)	ASD	Ages 7–10, male & female	N = 620 Typical n = 260 & Atypicaln = 360	Visual reflex neurotraining	Visual reflex assessment, visual skills assessment, academic abilities of reading and writing	Study group, academic reading scores improved in 43.33% of children (n = 104); and academic scores for writing improved in 33.75% (n = 62). Other noted improvements included oral-motor skills, improved clarity in sound pronunciation, language comprehension.	2B
Masgutova et al. (2016a)	ASD	Ages: 4–19 years male & female	N = 1,039 Typical n = 483 & Atypicaln = 556	Neuro-structural reflex integration; tactile-neural integration; dynamic & postural reflex repatterning; visual & auditory reflexes integration; oral-facial reflex integration; proprioceptive/ vestibular & cognitive integration; lifelong reflex integration; archetype movement integration	MNRI® Reflex assessment & Questionnaire of Dynamic Changes of Children's Abilities	Positive changes in all 10 areas of the Questionnaire of Dynamic Changes of Children's Abilities	2B

Masgutova et al. (2016b)	ASD	Ages: 4–19 years, male & female	N = 1,301 Typicaln = 683 & Atypicaln = 618	Dynamic & postural reflex pattern integration; neuro-structural reflex integration; tactile-neuro integration; oral-facial reflex integration; visual & auditory reflexes integration; lifelong reflex integration; archetype movement integration; proprioceptive/ vestibular and cognitive skills development	MNRI® reflex assessment and Questionnaire of Dynamic Changes in Children's Abilities	Positive changes in all 10 areas of the Questionnaire of Dynamic Changes in Children's Abilities	2B
Masgutova, Sadowska et al. (2016)	Down syndrome	Ages: 6 months–18 years, male & female	N = 880 Typical n = 780 & Atypical n = 100	Neurosensorimotor reflex integration points	MNRI® reflex assessment	Improved cognitive, language, and communication skills; reduction in decrease in behavioral issues	2B
Masgutova et al. (2017)	x	**Study group**: (340) professionals **Control group**: (124) individuals with high-ranking jobs as business managers and directors of offices, ages 32–54 with experience of 3–10 years of work.	N = 464 Typical: n = 464	MNRI® anti-stress program	Modified tests of survival roles by S. Wegsheider-Cruse, MNRI® reflex assessment, and *Stress Resiliency Questionnaire*	Improved stress resilience, well-being in life and work	2B
Nowak & Sendrowski, 2017	brain paralysis & brain damage, ASD, fears, phobias, obsessive compulsive	x	x	Tactile-neuro-integration	x	Stimulates natural developmental progression, self-regulation, and normalization of general sensory integration	5

	disorder (OCD), suppression in psychomotor development, hyperactivity disorder, PTSD, learning difficulties & dyslexia, suppressions, and speech disorders						
Pilecki et al. (2012)	Cerebral palsy	Ages: 1.3–5.9 years, male & female	N = 17 Atypicaln =17	Specific reflex patterns used: foot tendon guard; hands supporting; leg cross flexion- extension; galant; asymmetric tonic neck reflex; diaphragm mobilization reflexes	Brainstem auditory evoked potentials	None specified	4
Renard-Fontaine, 2017	Amniotic band syndrome	Age: 10 weeks, female	N = 1	Specific reflex patterns used: Robinson hand grasp; hands supporting; Babkin palmomental; spinal perez; spinal galant; STNR; Babinski; foot tendon guard; leg cross flexion-extension; Bauer crawl; trunk extension	AROM and MMT involved extremity, MNRI® reflex assessment, and Mullen Scales of Early Learning	Improved movement transitions, floor mobility, self-protection during parachute response, emerging functional use of upper limb, & general milestone attainment	3B
Shackleford et al. (2017)	x	Individuals involved in the Louisiana flooding in Baton Rouge & Lafayette	N = 1,375 Typical n = 1,086 & Atypicaln = 289	MNRI® trauma recovery protocol	MNRI® reflex assessment	Improved joy in life, restorative sleep, stress resilience and optimism	2B

Note: X indicates none reported; MNRI® indicates Masgutova Neurosensorimotor Reflex Integration; STNR indicates symmetrical tonic neck reflex; ATNR indicates asymmetrical tonic neck reflex; Evidence Level indicates level described by the *Oxford Centre for Evidence-Based Medicine Standard Levels of Evidence* (Law & MacDermid, 2014).