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**Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists**

by

Jerzie-Ann Marie Coppola

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Submitted in partial fulfillment for the degree of

DOCTOR OF PHILOSOPHY IN HEALTH SCIENCES

INTERPROFESSIONAL HEALTH SCIENCES

SETON HALL UNIVERSITY

INTERPROFESSIONAL HEALTH SCIENCES (HIS) CAMPUS, NUTLEY NJ

2022

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School of Health and Medical Sciences

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### APPROVAL FOR SUCCESSFUL DEFENSE

Jerzie-Ann Coppola has successfully defended and made the required modifications to the text of the doctoral dissertation for the Ph.D. in Health Sciences during this Spring Semester, 2022.

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I acknowledge my colleagues, the MNRI® Core Specialists who participated in this study, with the most profound thanks. It is an honor to be part of this international group and work alongside you, supporting children and families to reach their greatest potential. I learned so much working with all of you, and I am inspired by your expertise, dedication, drive, and compassion.

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## **DEDICATION**

This dissertation is first and foremost dedicated to by children, Dominic Michael and Luca Vincent. I hope you will always see the value of hard work and dedication, the importance of education, and will use science to guide your decisions.

I also dedicate this to my husband Frank, who allowed me to follow this dream and realize this goal while providing endless support and encouragement. I am so excited to start our next chapter together.

“The infant movements do not disappear as development progresses, ... the centers that direct them continue to work in conjunction with higher nervous formations and enter into their composition as subordinate units and yield a part of their functions upward to younger and newer centers”

~ *Lev Semenovich Vygotsky, 1896-1934*

*(as Cited in Rieber, 1998, p. 220)*

## ABSTRACT

### EXPLORING RESEARCH KNOWLEDGE, ATTITUDE, AND PRACTICE OF MNRI® CORE SPECIALISTS

By

JERZIE-ANN MARIE COPPOLA

Seton Hall University  
2022

Dissertation Chair: Dr. Deborah DeLuca, M.S., JD

*Statement of the Problem:* The Masgutova Method® is a research emergent area with a growing yet limited research base. In order to facilitate a widespread and robust acceptance and integration of The Masgutova Method® as evidence-based practice, a significant increase in research is warranted. MNRI® Core Specialists are well positioned to be scholars in The Masgutova Method®. At this time, there is no literature exploring MNRI® Core Specialists' foundational research knowledge, attitude toward research, and research practice.

*Purpose of the Study:* The purpose of this study is to establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practices.

*Methods:* This study utilized a *modified* concurrent parallel mixed-methods methodology. The survey questionnaire included The Research Knowledge Assessment®, Attitudes Toward Research Scale®, the Wessex Research Network Spider®, and open-ended questions exploring barriers and facilitating factors to research. A sample of 69 United States-based and 33 International MNRI® Core Specialists participated in this study ( $n = 102$ ).

*Results:* *Research Knowledge* scores on the Research Knowledge Assessment® ranged from 24.00 to 96.00, with  $M = 54.71$ ,  $SD = 15.08$  and  $\alpha = .82$ . *Research Attitude* scores on the Attitude Toward Research Scale® ranged from 2.73 to 6.50, with  $M = 4.64$ ,  $SD = 0.74$ , and  $\alpha = .89$ . *Research Practice* scores on the Wessex Research Network Spider ranged from 1.00 to 5.00, with  $M = 2.16$ ,  $SD = 0.84$ , and  $\alpha = .94$ . Using Spearman Correlation Coefficient, Educational Degree was related only to Research Practice  $r_s(102) = .38, p < .001$ . The Spearman correlation between Years of Professional Experience and Research Knowledge, Research Attitude, and Research Practice was not statistically significant. The Spearman correlation between Research Knowledge and Research Attitudes was statistically significant,  $r_s(102) = .35, p < .001$ . The Spearman correlation between Research Knowledge and Research Practice was statistically

significant,  $r_s(102) = .22, p = .030$ . The Spearman correlation between Research Attitudes and Research Practice was statistically significant,  $r_s(102) = .48, p < .001$ . Barrier and Facilitating factors to research engagement included individual factors, methodological factors, organizational factors, recognition in the medical community- range of evidence, and emotions.

*Conclusions:* A baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice can inform future research capacity-building initiatives in The Masgutova Method®. Successful research capacity-building initiatives can facilitate research engagement, expand the available empirical literature, and ultimately increase practitioners' potential for evidence-based practice when using The Masgutova Method®.

*Keywords and phrases:* Masgutova Neurosensorimotor Reflex Integration (MNRI®), The Masgutova Method®, MNRI® Core Specialist, Knowledge Attitudes Practice Model (KAPM), Research Knowledge, Research Attitude, Research Practice, Research Knowledge Assessment© (RKA), Attitudes Toward Research Scale© (ATR-S), and Wessex Research Network Spider © (WReN).

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## Chapter 1: Introduction

The current culture of the health care industry emphasizes evidence-based practice (EBP) because "empirically based care is more likely to be cost effective, appropriate, and justified" (Dickinson et al., 2004, p. 117). EBP is the convergence of the best research evidence, the clinician's expertise, and the values/expectations of the client (Gibbs, 2003). The availability of empirical evidence is one of the cornerstones of EBP (Burns et al., 2011). Although EBP is the gold standard for client care in the health care industry, strict adherence to EBP is reportedly low in many practice areas (Mikhail et al., 2005; Holmes et al., 2004). For example, McGlynn et al. (2003) estimate that only 54.9% CI [54.3, 55.5] of Americans receive the recommended health care, including preventative, acute, and long-term health care. In addition to barriers to translating evidence into practice, an additional barrier to EBP is the lack of available evidence. At this time, The Masgutova Method® lacks the empirical evidence to be considered EBP.

The Masgutova Method® is an interprofessional therapeutic approach that is currently being utilized by health care professionals, in a variety of settings, despite having a limited empirical base. To understand how many professionals are trained in The Masgutova Method®, in the United States alone, the combined attendance at continuing education classes from 2017-2019 was 7582 participants (Jessica Rife, Personal Communication, 2019). Among those trained in The Masgutova Method®, there is a core group of professionals. These professionals are MNRI® Core Specialists. MNRI® Core Specialists are interdisciplinary health care professionals that have completed the MNRI® Core Specialist Internship Program. In addition to this internship program, starting in 2021, interested professionals can now attend The Masgutova Graduate School of Neurodevelopmental Sciences. Graduates of this program will receive a master's degree in Neurodevelopmental Science.

Considering the importance of empirical evidence, the limited research base to support the effectiveness and efficacy of The Masgutova Method® is a barrier to EBP. The latest publications, from 2012 to 2021, on The Masgutova Method®, have explored the effect of this therapeutic intervention on the nervous system (Bell et al., 2019; Masgutova et al., 2020), the immune system (Tatarinova et al., 2020), physiological markers (Deiss et al., 2019), reflex pattern development (Masgutova et al., 2018), and functional skill development (Renard-Fountaine, 2017) following an intensive therapy program. The most recent publication explored the "Effect of the MNRI Reflex Neuromodulation on the QEEG and Neurotransmitters of Children Diagnosed with Cerebral Palsy" (Masgutova et al., 2020).

A significant increase in scholarship in The Masgutova Method® is warranted to facilitate a widespread and robust acceptance and integration of The Masgutova Method®. "Competent researchers are needed" within The Masgutova Method® to "produce quality research and provide evidence-based practice" for those implementing this approach (Swank & Lambie, 2016, p. 91). MNRI® Core Specialists are well-positioned to be scholars in The Masgutova Method®. In addition to successfully completing the MNRI® Internship program and having the most experience with The Masgutova Method®, MNRI® Core Specialists are also from professional fields that emphasize evidence-based practice and whose educational programs aim to foster research capacity in their graduates (Accreditation Council for Occupational Therapy Education [ACOTE], 2018; American Physical Therapy Association [APTA], 2019). Finally, MNRI® Core Specialists are primary stakeholders in The Masgutova Method®. Stakeholders are defined as "individuals, organizations or communities that have a direct interest in the process and outcomes of a project, research or policy endeavor" (Deverka et

al., 2012, p. 5 in PDF). As primary stakeholders, MNRI® core specialists can serve as “knowledge creators” (Nieva et al., 2005, p. 446) through increased research engagement.

To foster research engagement, it is important first to have a baseline understanding of research knowledge, attitude, and practice. "Adequate research knowledge, positive attitude toward research, and research practice have been identified as crucial to carrying out ... research" (Noorelahi et al., 2015, p. 479). These domains are often considered core competencies of scholarship. Abreu et al. (1998, p. 754) state that "competence in research is a complex matrix involving knowledge, skills, and attitudes." Although literature exists exploring evidenced-based practice and research in related health care professionals (Pager., 2012; Eckerling et al., 1988; Aljadi et al., 2013, Finch et al., 2013; Karlsson & Tornquist, 2007), there have been no studies examining MNRI® Core Specialists. A study examining MNRI Core Specialists' research knowledge, research attitude, and research practice (KAP) is a foundational step to facilitate programmatic changes that support the development of clinician-researchers in The Masgutova Method®.

In this study, research knowledge is the understanding and comprehending of foundational research methodology (Swank & Lambie, 2016). It is important to explore research knowledge because "sound research knowledge is a prerequisite for scholar-researchers (Lambie et al., 2014b, p. 139). Increased research knowledge is associated with increased research attitude, assuming a linear hierarchical progression to research knowledge, research attitude, and research practice (Valente et al., 1998). In this study, research attitude is an individual's view of research, including one's overall attitude, perception of the usefulness of research, and positive/negative feelings toward research (Papanastasiou, 2005; Papanastasiou, 2014). Research attitude can be an important predictor of research practice (i.e., research involvement and

intention to conduct research) (Abun et al., 2019, p 74). Research practice is experience with discrete research activities. In research practice, research skills are interwoven with research knowledge (Baartman & de Bruijn, 2011).

A baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice can have significant practical implications because it can inform future research engagement through capacity-building initiatives. Research capacity is defined as having "competence in scientific inquiry and research" (Abreu et al., 1998, p. 751). Research capacity building initiatives "refers to advancing a service or individual's ability to understand, utilise and undertake research" (McDermott & Bawden, 2017, p. 2) through improving research competence, increasing the volume of research, influencing health care practice and policy, and improving client's health and function (Webster et al., 2011, p. 107). A successful research capacity-building program can facilitate research engagement, expand the available empirical literature on The Masgutova Method®, and ultimately increase the potential for evidence-based practice by health care practitioners when using The Masgutova Method®.

## **Organization of Chapter 1**

Chapter One is organized into the following sections:

1. Introduction to The Masgutova Method®
2. Operational Definitions
3. Background to the Problem
4. Problem Statement
5. Purpose of the Study
6. Significance Statement
7. Theoretical Perspective
8. Research Questions

## **Introduction to The Masgutova Method®**

Masgutova Neurosensorimotor Reflex Integration (MNRI®), or The Masgutova Method®, consists of a series of programs, each composed of manual neuromodulation exercises (Koberda & Akhmatova, 2016). Neuromodulation is defined as a "broad term describing techniques that have the ability to directly affect the functional and developmental mechanisms of the brain or central nervous system" (Koberda & Akhmatov, 2016, p. 1). The primary aim of the overall method is to bring "primary reflexes into a state of integration" (Deiss et al., 2019, p. 31). "Rather than focusing on specific neurological disorders and disease," The Masgutova Method® emphasizes the sensorimotor circuits of primary movement patterns (Deiss et al., 2019, p. 31). This program is utilized by professionals, of interdisciplinary backgrounds, working with clients, presenting with developmental delays, motor control disorders, behavior disorders, speech/language disorders, genetic disorders, trauma-related disorders, immunological conditions, and learning disabilities (Akhmatova et al., 2015abc; Deiss et al., 2019; Masgutova & Masgutov, 2017; SMEI, LLC, 2015a). The most recent scientific article on The Masgutova Method® states that "the fundamental goals of the MNRI® module [The Masgutova Method®] is to utilize reflex patterns for improvements of daily functioning in individuals with disruption of the sensory-motor integration, increasing stress and immune system resilience, physical wellness, behavioral and emotional regulation, and cognitive skills" (Tatarinova et al., 2020, p. 16). This approach specifically addresses primary reflex motor patterns, and views reflexes as being "part of our genetic and epigenetic inheritance" (SMEI, LLC, 2015a, p. 33). The literature, on The Masgutova Method®, asserts that it can be utilized with clients of all ages throughout the life span (SMEI, 2015a, p. 33).

Conceptually, The Masgutova Method® defines a reflex as both "a unit of the nervous system presenting an unconditioned physical response to a sensory stimulus" (SMEI, LLC, 2015a, p. 33) and the "neurophysiological foundation for higher brain functioning" (Deiss et al., 2019, p. 31). The foundational concepts presented in The Masgutova Method®, "replace[s] the traditional theory of reflexes as primitive survival responses that become *inhibited* with normal development" (Deiss et al., 2019, p. 31). Primary reflexes have the dual purpose of protection to ensure survival in early infancy and in response to potential traumas and a developmental role in supporting higher-level cortical skill progression (Deiss et al., 2019; SMEI, LLC, 2015a).

To understand the dual purpose of a reflex pattern, Robinson Hand Grasp Reflex (RHGR), as described in The Masgutova Method® training manual, is described here. RHGR emerges during the 11<sup>th</sup> week of gestation and continues to 12 months of age. The sensory stimulus of this reflex is initiated with tactile and proprioceptive touch in the upper area of palm, at the base of the fingers. The expected motor response, for this pattern, is the closing of the fingers (flexion) and adduction of the thumb, with the thumb resting on the outer surface of the closed fingers. An example of the protective role of the RHGR is to "hang on for dear life" and facilitate support for balance (Masgutova & SMEI, LLC, 2007-2012, p. 27). An example of the protective role of RHGR is when grabbing the subway's hand bar to avoid losing balance. Typical progression of this pattern through its developmental phases allows for the development of higher-level cortically learned manual hand skills, such as writing or playing the piano (Masgutova, & SMEI, LLC, 2007-2012).

Although first introduced to the United States in 1996, The Masgutova Method® was first presented in Russia, in 1989, by creator Dr. Svetlana Masgutova (Bell et al., 2019; Masgutova & Curlee, 2007). The exercises, within The Masgutova Method®, evolved from her

work with both child and adult trauma survivors of natural and man-made disasters (i.e., Ulf Train Accident, Chernobyl, Baku War) and the later application of that work to individuals who had experienced birth trauma, neurodevelopmental delays, stress/trauma-related disorders, and medical illness (SMEI, LLC, 2015a, p. 18; Masgutova & Masgutov, 2017; Masgutova & Curlee, 2007). The Masgutova Method® is based on Dr. Masgutova's empirical research and ongoing clinical observations of over 35,000 children and adults with learning disabilities, physical disabilities, medical illness, and stress/trauma-related disorders (Deiss et al., 2019; Renard-Fontaine, 2017). The work of Charles Sherrington, I.P. Pavlov, L.S. Vygotsky, A.R. Luria, Nikolai Bernstein, and Ivan Sechenov, is credited as providing the "neurophysiological" and theoretical foundation of The Masgutova Method® (SMEI, LLC, 2015a). These scientists shifted the scientific community's view of reflexes by placing them within the context of both higher brain centers, which are responsible for physical, emotional, and cognitive development, and lower brain centers, which are responsible for protection and survival (SMEI, LLC, 2015a, p. 20).

The Masgutova Method® has proposed several reasons why reflexes may "fail to emerge or integrate at the natural, appropriate time" (SMEI, LLC, 2015a, p. 25) and the circumstances that prompt the re-emergence of reflexes after a period of normal integration (p. 19). However, no empirical evidence to support this proposal has been published. Instead, based on clinical observation, practice-based evidence suggests that it is the result of one or more influencing factors. These factors, as described in The Masgutova Method® literature, may include: (a) genetic influences, (b) toxicity, (c) sensory-motor deprivation, (d) physical or emotional trauma, (e) pre-mature birth/birth trauma, (f) disease, or prolonged, intermittent, or chronic stress (SMEI, LLC, 2015a). "Depending on the magnitude of the impairment, a reflex may: (1) emerge, mature

and integrate with little or no problem; (2) emerge, fail to mature, and remain dysfunctional; (3) emerge pathologically; or (4) fail to emerge [a-reflexive]" (SMEI, LLC, 2015a, p. 19).

Additionally, the reflex pattern can be re-triggered to (5) re-emerge as a protective response (SMEI, LLC, 2015a).

The Masgutova Method® is "based on the supposition that impaired reflex circuits can be reconstructed. The training of reflexes appears to result in the awaking of genetic sensorimotor memory" (Koberda & Akhmatova, 2016, p.1). The neuromodulation techniques, found in this program, address dysfunctional, pathological, a-reflexive, or re-emerged reflexes by using "non-invasive natural and replicable [manualized] neuromodulation techniques" (Renard-Fontaine, 2017) through non-verbal tactile and proprioceptive exercises. These exercises, often called *repatterning*, *patterning*, or *reflex integration* exercises, are designed to "facilitate the emergence, maturation, and integration process of primary reflex motor patterns" and the development of the "tactile, visual, auditory, and proprioceptive systems" (SMEI, LLC, 2022a, para. 4).

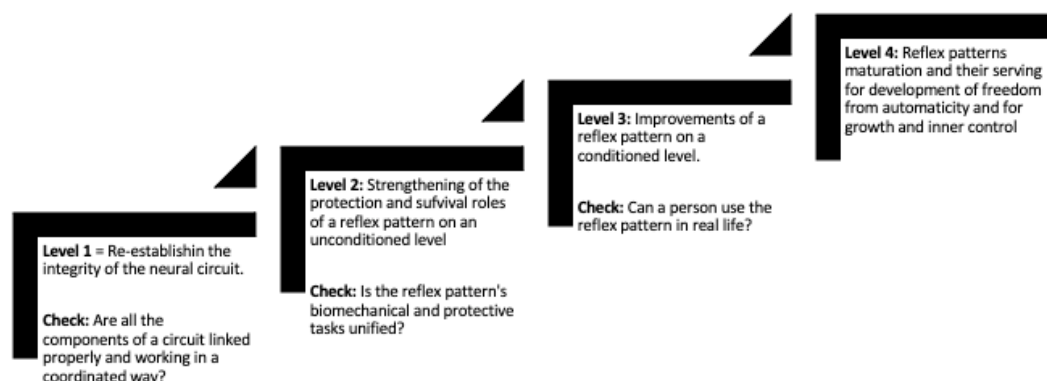
As described in the literature on The Masgutova Method®, one function of the exercises is to activate the extrapyramidal nerve system (EPNS). The EPNS consists of all the parts of the nervous system, except for the cerebral cortex. Parts of the EPNS include the diencephalon, brain stem, spinal cord, and peripheral nerves (Koberda & Akmatova, 2016). The EPNS is "responsible for automatic mechanisms and processes, the extension of links between neurons, the growth of neural nets, myelination, and the creation of new nerve routing" (Bell et al., 2019, p. 294). Based on the notion that reflexes, in addition to their role for protection and survival, are the foundational units for higher-level skills, improved development of the reflex patterns, using

The Masgutova Method®, is inferred to facilitate physical, cognitive, emotional, and social development (Koberda & Akhmatova, 2016; Renard-Fontaine, 2017; Deiss et al., 2019).

Although a description of each exercise, within The Masgutova Method®, is beyond the scope of this review, the exercises work to remind the body of the precise *three part* dynamics of the reflexive pattern, which would have been stimulated in normal development. This foundation serves as a *template for growth*, allowing the reflex to *progress* in its advancement through the phases of reflex development. The ultimate goal of each exercise is to facilitate full maturation and integration of the reflexive pattern. The *patterning*, *re patterning*, or *integration* of these reflexes is achieved by activating a reflexive pattern through sensory or proprioceptive stimulus, and later, pairing that sensory stimulus with the replicated, proper motor response, and its variants, by means of passive, active, isometric, and isotonic motor movements (Masgutova & SMEI, 2007-2012; Renard-Fontaine, 2017).

RHGR is described here as an example of a The Masgutova Method® exercise. First, activation of the reflex pattern is initiated by applying a tactile and proprioceptive touch in the upper area of palm, at the base of the fingers, with the shoulder positioned at 90° of flexion. Next, this stimulus is paired with the specific motor response of closing of the fingers (flexion) and adduction of the thumb, with the thumb resting on the outer surface of the closed fingers. The motor response is achieved passively (i.e., the professional facilitates the motor response, actively (i.e., the client actively closes the hand), isometric (i.e., the client maintains a closed hand position with resistance), and isotonic (i.e., the client moves in and out of the closed finger position with slight resistance) motor movements.

The Masgutova Method® describes four levels of reflex integration (Masgutova & Masgutov, 2017).

**Figure 1***Levels of Reflex Integration*

*Note.* Adapted from *Post-Trauma Recovery: Gentle, Rapid, and Effective Treatment with Reflex Integration* (p. 89), by S. Masgutova & D. Masgutov. Copyright 2017 by 1<sup>st</sup> World Publishing.

**Operational Definitions**

- *Research Knowledge* is the foundational understanding and comprehension of research methodology (Lambie et al., 2014ab).
- *Research Attitude* is the self-reported view of research which includes overall attitude, perception of the usefulness of research, and positive/negative feelings toward research (Papanastasiou, 2005; Papanastasiou, 2014)
- *Research Self Efficacy* is the confidence in one's research ability (Lambie et al., 2014b)
- *Research Motivation* is the willingness to engage in research.

- *Research Practice* is the self-reported active participation in individual or collaborative scientific investigations. Research practice includes barriers and facilitating factors (Smith et al., 2002; Roelens et al., 2006, Muleme et al., 2017).
- *Barriers* are the factors that prevent or make research less likely (Roelens et al., 2006).
- *Facilitators* are the factors that increase the likelihood of research (Roelens et al., 2006).
- *Agreement* is the degree to which one believes research is necessary (Roelens et al., 2006).
- *Outcome Expectancy* is the anticipated positive or negative outcome of research (Roelens et al., 2006).
- *Feasibility* is the state in which active participation in research is performed easily; it includes barrier and facilitating factors (Roelens et al., 2006).
- *Research Experience* is the self-reported active participation in research activities (Smith et al., 2002).

For additional background information, please see **Appendices K-O**. The purpose of the additional background information is to enhance the readers understanding of important related topics. **Appendices K-O** includes the following topics: Basics of the Nervous System, Physiology of a Reflex, The Masgutova Method® Educational Program, Key Terms, and Understanding the MNRI® Reflex Assessment.

## **Background to the Problem**

The Masgutova Method® is currently being utilized by occupational therapists, physical therapists, speech therapists, nurses, and other health care professionals when working with individuals with various impairments and disabilities. *A systematic review of the literature*

*revealed a growing yet limited research base to support the efficacy of The Masgutova Method®.* This impacts various stakeholders. These stakeholders include individuals with disabilities, parents/caregivers, referring physicians, health care providers, policymakers, and payor systems (i.e., federal, state, and private). Therefore, a significant increase in empirical evidence is needed to expand the research base for professionals using The Masgutova Method®.

The health care industry and regulatory agencies strive to identify the most effective and cost-effective practices to support improved client outcomes, quality of care, and patient experience (Stichler et al., 2011; Berwick et al., 2008). To achieve this, an emphasis has been placed on evidence-based practice (EBP) (Lieberman et al., 2011) and practice-based evidence (PBE) (Cook & Cook, 2016). To facilitate a widespread and robust acceptance and integration of The Masgutova Method®, a significant increase in scholarship (i.e., research engagement, research generation, or research productivity) in The Masgutova Method® is warranted. A baseline understanding of MNRI® Core Specialists' research knowledge, attitude toward research, and research practice can inform future initiatives to build research capacity in The Masgutova Method®. Currently, very little is known about MNRI® Core Specialists' research knowledge, attitude, and practice in The Masgutova Method®.

## **Problem Statement**

*The Masgutova Method® is a research emergent area with a growing, yet limited, research base. To facilitate a widespread robust acceptance and integration of The Masgutova Method®, a significant increase in research on The Masgutova Method® is warranted. MNRI® Core Specialists are well-positioned to be scholars in The Masgutova Method®. However, at this*

time, there is no literature exploring MNRI® Core Specialists' foundational research knowledge, attitude toward research, and research practice.

### **Purpose of the Study**

*The purpose of this study is to establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practices.*

MNRI® Core Specialists are professionals from multi-disciplinary backgrounds who have completed the MNRI® Internship program and hold the highest certification currently available in The Masgutova Method®. These individuals are also from professional fields that emphasize evidence-based practice and whose educational programs aim to foster research capacity in their graduates (Accreditation Council for Occupational Therapy Education [ACOTE], 2018; American Physical Therapy Association [APTA], 2019). Because of this, they are uniquely positioned to be researchers of The Masgutova Method®. Although literature exists exploring evidenced-based practice and research in related health care professionals (Pager et al., 2012; Aljadi et al., 2013; Finch et al., 2013; Karlsson & Törnquist, 2007), there have been no studies examining MNRI® Core Specialists.

### **Significance Statement**

This research is significant because of its practical implications. *A baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice can inform future research capacity-building initiatives.* Moreover, identifying facilitating and barrier factors may highlight opportunities to support MNRI® Core Specialists' research engagement.

By serving as a springboard to research capacity-building initiatives, there is an opportunity to increase research engagement and therefore increase the breadth of empirical evidence in The Masgutova Method®. The availability of empirical evidence is the cornerstone of evidence-based practice. Evidence-based practice benefits a range of stakeholders, including clients, parents making medical decisions, referring physicians, and reimbursement practices of insurances and other health care regulators.

### **Theoretical Perspective**

A study exploring the research knowledge, attitude, and practice of MNRI® Core specialists is best informed by a *primarily* intrapersonal level theory or model. The model utilized in this study is the Knowledge Attitude Practice Model (KAPM). The KAPM is a domain-level model that depicts the link between an individual's knowledge, attitude, and practice (Valente et al., 1998). This model has been used to examine behaviors in various disciplines, including exercise behavior, public health, and family planning (Valente et al., 1998; Chaffee & Roser, 1986).

### ***Theoretical Foundation***

The *theoretical framework* "is derived from an existing theory in the literature that has already been tested and validated by others and is considered a generally accepted theory in the scholarly literature (Grant & Osanloo, 2014, p. 16). For this study, the theoretical framework is comprised of various learning theories, including Cognitive Learning theory, Behavioral Learning Theory, and Social-Cultural Learning Theory (Jenson & Monstrom, 2013). However, it is important to note that this list is not exhaustive.

The Domains of Learning, initially posited by Bloom, Krathwohl, and colleagues (Bloom, 1956; Simpson, 1972, Krathwohl et al., 1964), organizes five domains that have implications for educational objectives and multi-dimensional learning (Jensen & Mostrom, 2013; McNeil, 2011). The five domains of learning are described as (1) cognitive, (2) affective, (3) psychomotor, (4) perceptual, and (5) spiritual. Although it is recognized that all five domains have a role in learning, the first three domains are the most clearly "defined and developed" (Jensen & Mostrom, 2013, p. 26). A taxonomy of progressively more complex levels has been defined for the first three domains (1) cognitive (Bloom, 1956), (2) psychomotor (Simpson, 1972), and (3) affective (Krathwohl, 2002; Krathwohl et al., 1964) domains. For each taxonomy, higher-level abilities are dependent on lower-level skills.

Cognition, or thinking (Jenson & Mostrom, 2013), was originally presented by Bloom (1956) as having six progressive levels (1) knowledge, (2) comprehension, (3) application, (4) analysis, (5) synthesis, and (6) evaluation (Bloom, 1956). Krathwohl (2002) modified and redefined the steps in the cognitive domain to include (1) remembering, (2) understanding, (3) applying, (4) analyzing, (5) evaluating, and (6) creating. Krathwoh et al. (1964) presented the taxonomy of the affective domain nine years later. The affective domain is defined as feeling or willing (Jenson & Mostrom, 2013, p. 26). It includes "interests, attitudes, appreciation and values" (Jenson & Mostrom, 2013, p. 27). The five levels of this domain are (1) receiving, (2) responding, (3) valuing, (4) organization, and (5) characterization (Krathwohl et al., 1964; as cited in Jensen & Mostrom, 2013, p. 28).

Simpson (1972) is referenced in the literature as providing a "useful" explanation of the psychomotor domain (Jenson & Mostrom, 2013). This domain explores *purposeful movement* or the actual the *doing* of a skill (Jenson & Monstrom, 2013). The levels of this domain are (1)

perception, (2) set, (3) guided response, (4) mechanism, (4) complex overt response, (5) adaptation, and (7) origination. At this time, the perceptual and spiritual domains remain less defined, although they are still regarded as essential aspects of learning and development. The perceptual domain pertains to the senses, and the spiritual domain means faith (Simpson & Monstrom, 2013). The first three domains initially presented in the Domains of Learning (Bloom, 1956; Krathwohl et al., 1964; Simpson, 1972), namely cognitive, psychomotor, and affective, comprise the conceptual model for this study.

The *conceptual model* "lays out the key factors, constructs, or variables, and presumes relationships among them" (Miles & Huberman, 1994, p. 440). For this study, the conceptual model is the Knowledge Attitude Practice Model (KAPM). The KAPM is the framework that serves as the "overall conceptual underpinning" of this study (Polit & Beck, 2012, p. 128).

### **Knowledge Attitude Practice Model (KAPM).**

*Knowledge* is the "capacity to acquire, retain and use information; a mixture of comprehension, experience, discernment and skills" (Bano et al., 2013, p. 30). *Attitude* is the "inclinations to react in a certain way to certain situations; to see and interpret events according to certain predispositions; or to organize opinions into coherent and interrelated structure" (Bano et al., 2013, p. 30). Finally, *practice* is the "application of rules and knowledge that leads to action. Good practice is an art that is linked to progress of knowledge and technology and is executed in an ethical manner" (Bano et al., 2013, p. 30). Badran described practice as knowledge and habit working together (Badran, 1995).

Authors have proposed six possible orderings, of the domains in this model, based on the notion that variations occur "systematically across domains, situations, or individuals" (Chaffee & Roser, 1986). Valente et al. (1998) summarize these six models. **Table 1** is adapted from their

work. Several of these models were introduced into the literature via contributions made by Chaffee & Roser (1986) that discussed the influence of *involvement* and *persuasion* on the relationship between *knowledge, attitude, and practice*. *Involvement* is defined as the degree of skill, time, resources, effort, and social support necessary to support participation in a research-related activity (Chaffee & Roser, 1986).

*High* involvement behavior is more likely to follow the "learning" sequence, that changes in knowledge, lead to changes in attitude, and subsequent changes in behavior. An alternative model is proposed for low involvement behaviors. For behaviors that require only low involvement, the behavior may change before changes in attitude or knowledge (Chaffee & Roser, 1986; Valente et al., 1998). *Persuasion* varies and can be dependent on the individual's level of involvement.

Under low involvement the person responds to superficial cues in the persuasion context, such as source likeability or credibility; under high involvement, however, persuasion is a function of the substance of the arguments presented in the message and is characterized by careful thought and consideration. (Chaffee & Roser, 1986, p. 377)

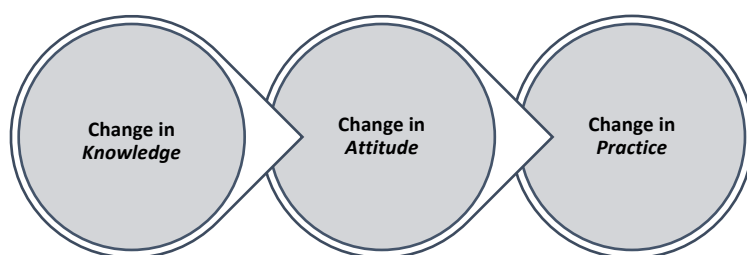
**Table 1**

*Behavior Change Sequences, Summary of Six Models*

Label	Model	Description
Learning	K-A-P	Cognitive progression
Affinity	A-K-P	Attitude encourages knowledge acquisition leading to practice
Rational	K-P-A	Improved knowledge facilitates more practice independent of attitude
Grudging acceptance	P-K-A	Experience fosters learning, influencing attitude
Dissonance	P-A-K	Practice facilitates positive attitude, knowledge increased through experience
Emotional	A-P-K	Attitude leads to practice; knowledge is secondary consideration

*Note.* Summary of six models of Behavior Change Sequences. Adapted from "Matching the message to the process: The relative ordering of knowledge, attitudes, and practices in behavior change research," by T. W. Valente, P. Paredes, & P. Poppe, 1998, *Human Communication Research*, 24(3), p. 369. Copyright 1998 by Human Communication Research.

Given that research engagement is a highly complex activity, which requires a high level of involvement, and, in the context of a study exploring research knowledge, attitude, and practice in The Masgutova Method®, a research study using this lens will most likely employ a "learning" hierarchy.

**Figure 2***Learning KAP Model*

*Note.* Adapted from "Matching the Message to the Process: The Relative Ordering of Knowledge, Attitudes, And Practices In Behavior Change Research," by T. W. Valente, P. Paredes, & P. Poppe, 1998, *Human Communication Research*, 24(3). Copyright 1998 by Human Communication Research.

The linear learning hierarchy of the KAPM "argues that individuals first learn about a practice, then develop a positive attitude toward it, and after passing through these stages, engage in the behavior" (Valente et al., 1998, p. 368). In other words, changes in knowledge, lead to a change in attitude, which leads to change in practices. Therefore, this model can provide a lens to understand MNRI® Core Specialists' research knowledge, attitude, and practice and determine the relationship, if any, between personal and practice factors and these domains.

*Strengths.*

The KAPM is a "logical" model (World Health Organization [WHO], 2012, p. 20). It is "consistent with everyday observations" and "supported by past research in the same area or related ideas" (World Health Organization [WHO], 2012, p. 20) and has strong practical implications, which include planning, implementing, refining, and evaluating programs (World

Health Organization [WHO], 2008; Launiala, 2009). The model is useful for gathering baseline information on what is known, what is believed, and what is being done regarding a certain behavior (WHO, 2008). Additionally, the construct of feasibility can play an important role in identifying barriers and facilitating factors to the behavior (World Health Organization [WHO], 2008).

Finally, the utilization of the KAPM model allows for conceptual integration of the study. Conceptual integration, as defined by Polit & Beck (2012), "means that the methods are appropriate for the research question, the questions are consistent with existing research evidence, and there is a plausible conceptual rationale for the way things are expected to unfold-including a rationale for hypothesis to be tested or for the design of the intervention" (p. 126). The KAPM is appropriate for a cross-sectional, non-experimental, descriptive, and correlational study (Rav-Marathe et al., 2016).

#### *Weaknesses.*

Although the KAPM model can serve as a useful lens for this study, several model weaknesses have been identified. First, the assumption that knowledge is the key determinant has been argued as one of the model's weaknesses (World Health Organization [WHO], 2012). "Knowledge is necessary but usually not sufficient factor in changing individual or collective behavior" (World Health Organization [WHO], 2012, p. 22; Green & Kreuter, 1991). For example, while examining the discrepancy in attitude and practice regarding contraception in four developing countries, Westoff (1988) found *intention*, which is accounted for in the Theory of Planned Behavior, and *unmet needs*, are stronger indicators of behavior than *knowledge* and *attitude*.

Additionally, assuming there is always a linear relationship between the domains is also a weakness of this model. Despite identifying six possible linear orderings of the domains in the KAPM model, there may be an inter-relationship between the domains that are not linear. The goal of this study is primarily descriptive. Although some sub-research questions begin to explore the relationship between variables, theory testing is not the purpose of this study.

The third weakness of this model is that there is only minimal attention directed toward the influence of contextual factors on behaviors (Launiala, 2009). The construct of *feasibility*, which explores barriers and facilitating factors to practice, has the possibility of highlighting some contextual factors on behavior. Utilizing a mixed-methods design, for example, including the addition of open-ended questions can help elucidate contextual factors and may enhance the validity of the study (Launiala, 2009).

"A person's knowledge, attitude, and practices are overarching categories that encompass more complex and subtle psychological and social dynamics, such as self-confidence and their susceptibility to peer pressure" (World Health Organization [WHO], 2008, p. 27). An example of this limitation can be highlighted when attitudes are explored. Attitudes can be challenging to measure and are interwoven with beliefs and values (Launiala, 2009).

### **Study Conceptual Framework.**

The study's conceptual framework is the application of KAPM to a study exploring MNRI® Core Specialists' research knowledge, attitude, and practice. Please refer to the operational definition subsection of this chapter for definitions of these terms.

The three domains identified in the model are *Research Knowledge*, *Research Attitude*, and *Research Practice*.

The attributes of this model include *Familiarity/Awareness*, *Agreement*, *Motivation*, *Perceived Self Efficacy*, *Perceived Research Motivation*, *Outcome Expectancy*, *Feasibility (barriers and facilitating factors)*, and *Research Experience* (Roelens et al., 2006).

**Figure 3**

*Study's Conceptual Framework*



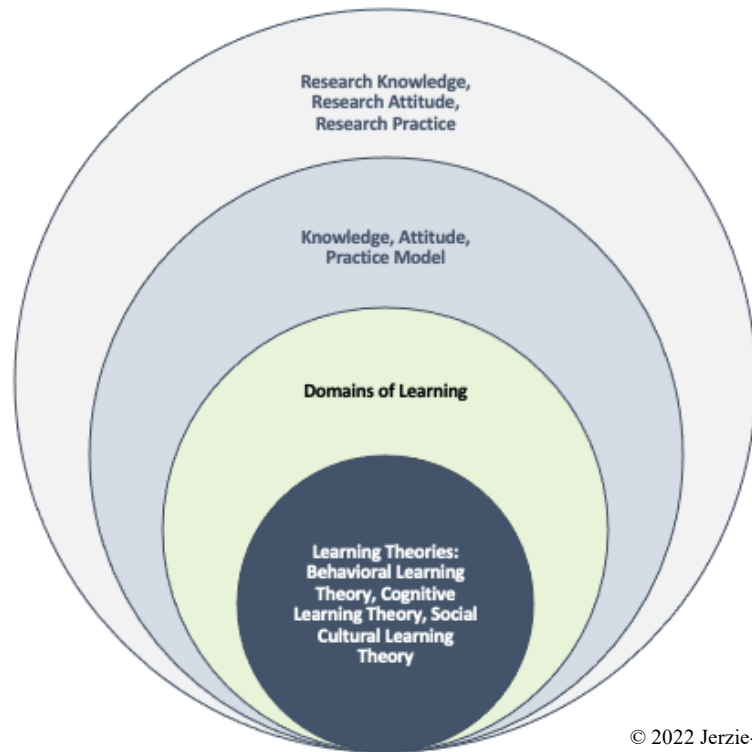
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*Note.* The study's conceptual framework uses the application of the KAPM to understand research. Adapted from *A Knowledge, Attitudes, and Practice Survey Among Obstetrician-Gynaecologists on Intimate Partner Violence in Flanders, Belgium*, by K. Roelens, H. Verstraelen, K. Van Egmond, & M. Temmerman, p. 4. Copyright 2006 by BMC Public Health.

This study aims to get a baseline understanding of MRNI® Core Specialists' research knowledge, attitude, and practice with these specific variables.

**Figure 4**

*Study Theoretical Perspective*



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**Table 2***Theoretical Perspective Summary*

Theory		Theoretical Framework	Conceptual Framework	Domains	Constructs
Learning Theories <sup>a</sup>	Domains of Learning	KAP Model (Domain Level Model)	Research Knowledge, Attitude, Practice Model	-	-
Cognitive Learning Theory	Knowledge	Knowledge	Research Knowledge	Research Knowledge	Familiarity/ Awareness
Social Cultural Learning Theory	Attitude	Attitude	Research Attitude	Research Attitude	Research Agreement Research Motivation Research Perceived Self Efficacy Research Outcome Expectancy
Behavioral Learning Theory	Practice	Practice	Research Practice	Research Practice	Research Feasibility (Barriers/Facilitators) Research Experience
-	Perceptual	-	-	-	-
-	Spiritual	-	-	-	-

<sup>a</sup> Denotes list is not conclusive

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**Research Question(s):****The overarching research question for this study is:**

What is the research knowledge, attitude, and practice of MNRI® Core Specialists?

**The sub-research questions and corresponding hypothesis, where appropriate, are as follows:**

**RQ1:** What are the *sociodemographic* and *professional characteristics* of MNRI® Core Specialists?

**RQ2:** What is the Research Knowledge of MNRI® Core Specialists, as measured by the Research Knowledge Assessment?

**RQ3:** What is the Research Attitude of MNRI® Core Specialists as measured by the Attitudes Toward Research Questionnaire?

**RQ4:** What is the Research Self-Efficacy of MNRI® Core Specialists?

**RQ5:** What is the Research Motivation of MNRI® Core Specialists?

**RQ6:** What is the Research Practice of MNRI® Core Specialists, as measured by the Wessex Network Research Spider?

**RQ7:** Is there a relationship between Educational Degree, Research Knowledge, Research Attitude, and Research Practice? (ED-RK, ED-RA, ED-RP)

**RQ7a:** Is there a relationship between Educational Degree and Research Knowledge?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Knowledge.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Knowledge.

**RQ7b:** Is there a relationship between Educational Degree and Research Attitude?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Attitude.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Attitude.

**RQ7c:** Is there a relationship between Educational Degree and Research Practice?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Practice.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Practice.

**RQ8:** Is there a relationship between Years of Professional Experience and Research Knowledge, Research Attitude, and Research Practice? (YOE-RK, YOE-RA, YOE-RP)

**RQ8a:** Is there a relationship between Years of Professional Experience and Research Knowledge?

$H_0$ : There is no relationship between Years of Professional Experience and Research Knowledge.

$H_a$ : There is a relationship between Years of Professional Experience and Research Knowledge.

**RQ8b:** Is there a relationship between Years of Professional Experience and Research Attitude?

$H_0$ : There is no relationship between Years of Professional Experience and Research Attitude.

$H_a$ : There is a relationship between Years of Professional Experience and Research Attitude.

**RQ8c:** Is there a relationship between Years of Professional Experience and Research Practice?

$H_0$ : There is no relationship between Years of Professional Experience and Research Practice.

$H_a$ : There is a relationship between Years of Professional Experience and Research Practice.

**RQ9:** Is there a relationship between each domain pairing? (RK-RA, RK-RE, RA-RP)

**RQ9a:** Is there a relationship between Research Knowledge and Research Attitude?

$H_0$ : There is no relationship between Research Knowledge and Research Attitude.

$H_a$ : There is a relationship between Research Knowledge and Research Attitude.

**RQ9b:** Is there a relationship between Research Knowledge and Research Practice?

$H_0$ : There is no relationship between Research Knowledge and Research Practice.

$H_a$ : There is a relationship between Research Knowledge and Research Practice.

**RQ9c:** Is there a relationship between Research Attitude and Research Practice?

$H_0$ : There is no relationship between Research Attitude and Research Practice.

$H_a$ : There is a relationship between Research Attitude and Research Practice.

**RQ10:** What are the barriers and facilitating factors to conducting research in The Masgutova Method®, as identified by MNRI® Core Specialists?

## **Chapter II: REVIEW OF THE RELEVANT LITERATURE**

### **Introduction to the Organization of the Section**

This literature review is divided into two parts. The first part examines the current empirical literature on The Masgutova Method®. The review of this literature provides an understanding of the current position of The Masgutova Method®'s empirical evidence and is the background for the topic of the study. The second part explores research knowledge, attitude toward research, and research practice in the related fields of occupational therapy (OT), physical therapy (PT), and speech language pathology (SL/P). This literature informed the sub-research questions and study methodology.

### **Thematic Analysis: The Masgutova Method® Literature**

Three categories of literature on The Masgutova Method® are available: (a) academic journal articles, (b) self-published and published books, and (c) self-published course manuals. The scope of this review is limited to peer-reviewed scientific journal articles. Five themes emerged from the thematic literature review of The Masgutova Method®. These included:

#### The Influence of The Masgutova Method® on:

1. *The Nervous System*
2. *The Immune System*
3. *Physiological Markers*
4. *Reflex Pattern Development*
5. *Functional Skill Development*

Before discussing the emergent themes from The Masgutova Method® literature, it is important to highlight one common denominator consistent throughout almost all the research studies. Data collection for these studies occurred at family educational conferences. *MNRI® Family Educational Conferences* are conducted by SMEI, LLC, and its international counterparts, in various locations. MNRI® Family Educational Conferences usually run from 4-8 days in the United States and 10-12 days internationally. Participants attending these conferences generally receive an assessment by Dr. Masgutova and six 50-minute sessions per day by a team of MNRI® Core Specialists in The Masgutova Method Core Programs (Neurotactile Reflex Integration, Neurostructural Reflex Integration, Archetype Reflex Integration, Dynamic and Postural Reflex Integration, Oral Facial/Visual Auditory Reflex Integration, & Proprioception and Cognitive Reflex Integration). In addition, participants receive lectures, individualized home programing, and personalized training in the techniques outlined in their home program. Although the number of days of conference study participants received for each study varies slightly, understanding the family educational conference is a key to understanding the methodology employed in almost all of the studies reviewed here.

***Theme 1: The Influence of The Masgutova Method® on the Nervous System***

Key findings regarding the *Influence of The Masgutova Method® on the Nervous System* included positive brain map changes, regulation of stress hormones, and the regulation of neurotransmitters. These studies constitute the more recent studies and offer more robust objective measurements than earlier studies' methodology. Neuromodulation is a "broad term describing techniques that have the ability to directly affect the functional and developmental mechanisms of the brain or central nervous system" (Koberda & Akhmatov, 2016, p. 1).

In 2016, an article by Koberda et al. entitled, “Masgutova Neurosensorimotor Reflex Integration (MNRI) Neuromodulation Techniques Induces Positive Brain Map (QEEG) Changes” was published. The objective measures of this study included brain mapping (QEEG) and Reflex Development Assessment ( $n = 53$ ) for individuals participating in an 8-day intensive program (six, 50-minute sessions) using The Masgutova Method®. The MNRI® Reflex Development Assessment evaluates five parameters of a reflex. For each reflex, four distinct features are scored. **Appendix O** describes these parameters in more detail.

Researchers hypothesized a positive correlation between brain mapping parameters and reflex assessment results. Participants, whose ages ranged from 2 to 47 years old (YO), were diagnosed with cerebral palsy (CP), autism spectrum disorder (ASD), post-traumatic stress disorder (PTSD), attention deficit hyperactivity disorder (ADHD), dystonia, and stroke. Pre-test assessments of reflexes revealed an overall poor development of reflex patterns among participants. Following intervention using The Masgutova Method®, post-test assessment demonstrated a significant positive change for 73% of the 30 reflexes tested. Pre- and post-brain mapping revealed similar positive results among participants described as “a reorganization and at least partial normalization of spontaneous brain electrical activity. The reorganization was most frequently observed in delta and theta frequency as well as in beta and high beta overexpressed activity” (p. 6). The authors concluded that the observed positive changes in the development of the reflexes, as measured in the reflex assessment, were related to the observed changes in the electrical brain activity.

The second article published in 2019, by Bell et al., examined the effect of The Masgutova Method® on neurotransmitter biomarkers. This study measured the magnitude of change for twelve neurotransmitters (epinephrine, norepinephrine, dopamine, DOPAC,

Serotonin, 5-HIAA, glycine, taurine gamma-aminobutyric acid, glutamate, phenylethylamine, and histamine) using urine analysis. Participants were divided into 4 study groups (SGs) ( $n = 80$ ), based on diagnosis, and compared to 1 control group (CG) ( $n = 115$ ). SG1 ( $n = 45$ ) consisted of participants with ASD, down syndrome (DS), CHARGE Syndrome (coloboma, heart defect, atresia choanae, restricted growth/development, genital abnormality, ear abnormality), and general developmental delay. Participants in SG2 ( $n = 14$ ) were diagnosed with CP, traumatic brain injury (TBI), seizures, or Tourette's Syndrome. Participants in SG3 ( $n = 3$ ) included individuals with either attention deficit disorder or attention deficit hyperactivity. Participants in SG4 ( $n = 10$ ) were diagnosed with an anxiety disorder or post-traumatic stress disorder.

Individuals assigned to a SG participated in an 8-day MNRI® Family Education Conference, with urine collection pre- and post-treatment intervention. Overall, the study demonstrated the regulation of stress hormones and neurotransmitters with a small effect in all groups. Individual SGs showed some variability in effect size changes. SG4 showed a medium effect size change for histamine and large effect size for changes in taurine. SG3 showed a small effect decrease in 5-HIAA, norepinephrine, and GABA. A medium effect increase was noted in DOPAC levels, with a medium decrease in epinephrine, glutamate, glycine, PEA, and histamine. The largest change in this group was a decrease in taurine (Bell et al., 2019, p. 313).

An article by Pilecki et al. (2012) utilized Brainstem Auditory Evoked Potentials (BAEP) in children with CP (pre-test  $n = 15$ , post-test  $n = 17$ ) stemming from diverse etiologies, following the introduction of exercises addressing six reflexes within The Masgutova Method® system (Foot tendon guard reflex, hands supporting reflex, leg cross flexion-extension reflex, spinal reflex, asymmetric tonic neck reflex, and reflex diaphragm mobilization). Specific measurements

included interpeak latency I-V (IPL I-V) and relative interpeak latency (IPL I-V). These measurements describe the time, in milliseconds, between excitation of the auditory nerve and the peak of transmission within the brainstem, specifically the interior colliculi located in the mesencephalon. Measurement of IPL I-V and IPS I-V is a direct examination of the brain stem portion of the auditory pathway and an “indirect assessment of CNS integrity” (Pilecki et al., 2012, p. 365).

Authors report that the BAEP is both a diagnostic and prognostic tool. Specifically, there is a correlation between IPL I-V value and motoric ability, such as independent mobility. Therefore, it is “expected that changes in the BAEP results reflect changes in other areas of the brain, including motor pathways lying in direct proximity to the brain stem segment of the auditory pathway” (Pilecki et al., 2012, p. 369). Statistical analysis, using the Student’s t-test (Right-sided  $p = 0.001$ , Left-sided  $p = 0.002$ ) for pairs and the Wilcoxon test (right-sided  $p = .001$ , Left-sided  $p = 0.004$ ), demonstrated an improved efficiency of the transmission along the auditory pathway. One strength of this article is the utilization of objective, standardized measures that are repeatable, reliable, and valid. Response to intervention did vary, and the sample size in this study was relatively small.

Next is a case report entitled, “Post-Trauma Recovery in Children of Newtown, CT Using MNRI® Reflex Integration” (Masgutova, 2016). This study is a comparative analysis of 134 children (4-19 YO) who were affected, directly or indirectly, by the Sandy Hook school shooting. These participants received the MNRI® Trauma Recovery Protocol. Control group data was previously collected and comprised two groups, a trauma-exposed (TE) group identified as CG1 and a trauma-free group identified as CG2. The MNRI® Trauma Recovery Protocol uses nonverbal techniques (i.e., exercises) aimed at addressing the protective functions

of reflexes by “directly address[ing] the extrapyramidal and subcortical brain structures that become dominant in stress, with their consequences of over-reactivity and limitation of rational decisions” (Masgutova, 2016, p. 2).

Objective measures utilized in this study included pre and post-test assessments of reflex parameters and The Questionnaire of Dynamic Abilities, which measures changes in the “level of stress resilience, emotional and behavioral regulation, and cognitive function” (p. 2). First, researchers found that the SG demonstrated a similar reflex profile to the comparison trauma-exposed group (CG1), especially for reflexes strongly linked with the HPA stress axis and protective responses. These reflexes fell in the dysfunctional or pathological category (*Note: A description of reflex function categories is available in **Appendix O***). Secondly, after two treatment sessions, there was a strong movement toward higher levels of functionality for all but 2 of the reflex patterns tested. Similar to reflex parameter changes, dynamic abilities scores moved in a positive direction. Researchers noted changes in “sensory-motor integration,” “behavior regulation and self-protection,” “emotional regulation,” “self-awareness,” “communication and interaction,” “stress vulnerability and resilience,” “physical health,” “school skills,” “cognitive processes and learning,” and “motivation for achievement and learning” as measured by The Questionnaire of Dynamic Abilities (p. 9-10). However, the research article did not report specific data regarding these changes. Importantly, researchers acknowledged that individuals related to this tragedy did participate in additional therapies outside of The Masgutova Method® (p. 9-10).

The researcher concluded that the decline in function of reflex patterns is an essential component when examining the effects of trauma on an individual. “Ignoring this marker in cases of traumatic stress and PTSD can mean missing essential work with the survival functions

of fight or flight and freezing, leading to panic attacks, hypervigilance, transmarginal inhibition, and dissociation” (p. 10). Additionally, using non-verbal techniques (i.e., exercises) to avoid re-victimization during trauma recovery appears to have great benefits.

Similar to the first article related to the trauma recovery of the Newtown school shooting survivors, a second article was published in 2017 regarding flood trauma recovery, also utilizing the MNRI® Trauma Recovery Protocol. The primary objective measure in this study was the MNRI® Reflex Assessment (*Note: See **Appendix O** for additional information on the MNRI® Reflex Assessment*). This study consisted of 79 participants ( $n = 79$ ). Thirty-four were children and 45 adults. The researchers utilized data from the previous study of Newtown survivors as the first CG1 ( $n = 210$ ) and previously gathered data on the reflex status of individuals with no significant trauma exposure ( $n = 730$ ) as CG2. The article specifically focused on reflexes that are known to be active during a protective response. In this study, a significant change ( $p < .05$ ), following intervention using The Masgutova Method®, for the core tendon guard reflex, Moro reflex, fear paralysis reflex, hands supporting reflex, and asymmetrical tonic neck reflex, was noted (Shackleford et al., 2017).

### ***Theme 2: The Influence of The Masgutova Method® on the Immune System***

Key findings regarding *The Influence of The Masgutova Method®* on the immune system have included regulating abnormal indicators, including T & B lymphocytes, natural killer cells, immunoglobulin levels, and cytokine. When combined with traditional treatments, the studies have also found a reduction in the frequency of relapses and severity for conditions such as bronchial asthma and chronic bronchitis (Akhmatova et al., 2015abc, Masgutova et al., 2013).

Immunity studies examining the “immunomodulating effects” of The Masgutova Method® on immune system responses have continued for the past 15 years. They include five

research studies reported in either scientific publications or event abstracts from scientific presentations. Here the term “immunomodulating” refers to the regulation of an immune system marker towards normalization. Meaning elevated levels decreased and suppressed levels increased. Research in this area included participants with various diagnoses, including herpes malformation, obstructive bronchitis, down syndrome, chronic airway disease, and bronchial asthma (Akhmatova et al., 2015abc, Masgutova et al., 2013).

In summary, studies have demonstrated: Normalizing effect on T-lymphocytes, including both absolute numbers (CD4/ CD5/CD3) and the normalization of T-helper cells. Study findings imply that The Masgutova Method® helps boost natural immune system functions. There is also a normalization of cytotoxic T-cells (CD3/CD8). A normalization of cytotoxic T-Cells means cells are ready to identify and destroy viral threats to the cells; Next, the studies indicate a normalizing effect on natural kills with an increase in natural killer cells (NK) (CD16) by 1.5-2 times. Natural killer cells play an essential role in the immune system (destroy virus and parasite-infected cells, target tumor cells, and regulate bone marrow cells; Finally, results indicate a normalization of B-lymphocytes. B cells have multiple roles. They (a) activate t-cells through antigen presentation and cytokine production, (b) support antiviral and antimicrobial defenses, (c) prevent inflammation, and (d) serve as regulatory cells for cellular and humoral responses (Akhmatova & Akhmatova, 2017a; Akhmatova et al., 2015c; Masgutova et al., 2013).

The first study evaluating the immunological status of children with DS (Akhmatova & Akhmatova, 2017a) explored the influence of The Masgutova Method® on the immune status of children using lymphocytes, immunoglobulins, and cytokines as objective measures. In addition, anxiety level was recorded using the C. C. Spielberger and Yu. L. Khanin Questionnaire. For this study, children in the SG participated in an MNRI® Family Educational Conference.

The SG consisted of ( $n = 49$ ) children aged 0 – 6 years old and a CG ( $n = 56$ ). Exclusion criteria consisted of children with acute inflammatory disease, chronic eczema, and exacerbation of atopic dermatitis. Statistical analysis utilized the Mann-Whitney U test and the Wilcoxon test. Statistical significance set at ( $p < 0.05$ ). Changes in the immunological profile of children in the SG were significant for regulating abnormal indicators, including T and B lymphocytes, natural killer cells, immunoglobulin levels, and cytokines. This report focused solely on immunological changes following The Masgutova Method® and did not provide a detailed description of any additional objective measurements.

The second study by Akhmatova et al. (2015b) examined the benefit of combining The Masgutova Method® with standard drug treatment (bronchospasmolytic, membrane-stabilizing, anti-inflammation agents, or antibiotics) for recurrent obstructive bronchitis (ROB) ( $n = 30$ , ages 2-13) verse standard drug treatment alone using immunological and cortisol markers. Statistical analysis included the Mann-Whitney U- test ( $p < 0.05$ ). The study revealed the regulation of immune system markers, including T lymphocytes, natural killer cells, leukocyte metabolic function, and cytokines. The authors suggest “that MNRI® regulates the production of IL- $I\beta$  and the regulator cytokines IFN- $\gamma$  and IL-12 and thus positively affects the interaction of the immune, endocrine, and nervous systems and ultimately homeostasis” (p. 8). The researchers concluded that adding The Masgutova Method® to traditional medical intervention can lessen the incidence and length of reoccurrence of ROB.

Three event abstracts that summarize research exploring The Masgutova Method® for herpes-associated multiforme erythema and chronic airway disease are reviewed here. Of note, the original research article could not be located for review. The first event abstract, related to immunology (Akhmatova et al., 2015c), reported The Masgutova Method’s ® influence on the

immune response of individuals with Herpes-Associated Multiforme Erythema (HAEM). The study included a CG ( $n = 15$ ), age 18-54 and a SG ( $n = 31$ ) age 25-40 with HAEM. Individuals in the study group participated in one of two treatment groups: pharmaceutical intervention (acyclic nucleosides) alone ( $n = 15$ ) or pharmaceutical and The Masgutova Method® ( $n = 16$ ). The intervention consisted of 14 days of MNRI® Family Educational Conference. Objective measures included cytokine and lymphocytes analysis. The authors conclude that the introduction of The Masgutova Method®, with traditional intervention, regulated the immune system's mechanisms, activated innate immunity, and reduced the severity and duration of relapses (p. 2).

The second event abstract focused on chronic airway diseases (Masgutova et al., 2013). This brief description describes The Masgutova Method® as an effective tool to treat chronic airway disease based on its influence on T lymphocytes, natural killer cells, leukocytes, and cytokines. Although the event abstract is much shorter and less detailed than the event abstract previously mentioned, its discussion and conclusion are similar.

Finally, the third event abstract examined the immunological efficiency of The Masgutova Method® for treating respiratory diseases. The study sample included children with recurring obstructive bronchitis and adults with bronchial asthma and chronic bronchitis (Children  $n = 196$ , 2-13 YO, & adults  $n = 94$ ) (Akhmatova et al., 2015a). Timing of data collection occurred over four points in time. Objective measurements included data from clinical history, just after intake of current episode, following conventional therapy indicated as antibiotics, and following The Masgutova Method® intervention. Main parameters included phagocytosis activation, plasma cortisol, lymphocytes, as well as, functional counts of sick days taken over a year, and a Disability Index for Children. Adults with chronic bronchitis

demonstrated decreased severity of symptoms, frequency of exacerbations, and number of sick days ( $65.5 \pm 3.4$  to  $6.6 \pm 3.24$ ). Individuals with bronchial asthma demonstrated a decrease in the number and severity of recurrent disease, an overall easier course of the disease, and a decrease in antibiotic and hormone use for treatment. Children with bronchial asthma ( $n = 35$ ) demonstrated decreased reoccurrences, a 3.7-fold drop in acute respiratory viral disease (ARVD), and a 1.8-fold decrease in bronchitis, resulting in fewer antibiotic treatments. Children with ROB with underlying ARVD and frequent bacterial infection showed a statistically significant reduction in phagocytosing neutrophils and their absorbing activity. The Masgutova Method® influenced phagocytosis and normalizing of the leucocyte index.

An additional subpopulation of children ( $n = \text{unknown}$ ) demonstrated an increase of B lymphocytes, T regulatory numbers, normalization of cell phenotypes, and regulation of CD3, CD4, CD8, CD9, CD25 lymphocytes, and natural killer cells. The cortisol response for children with chronic airway diseases tended to be lower than CG. The authors describe this group as having a tendency toward a Th-2 pathway—the Th-2 pathway balances Th-1 type cytokines. “The TH-2 cytokines include interleukins 4,5, and 13, which are associated with the promotion of IgE and eosinophilic responses in atopy, and also interleukin-10, which as more of an anti-inflammatory response” (Berger, 2000, p. 424). Even after traditional treatment, A.M. cortisol levels were lower than the group that received traditional treatment and The Masgutova Method®. The authors suggest that the addition of The Masgutova Method® influences the regulation of inflammatory cytokines.

In summary, the addition of The Masgutova Method® to traditional treatment influenced immunophenotype regulation with increased segmental neutrophils, increased absorbing action of neutrophils, normalization of leukocyte metabolic function, increase in the number of cells

expressing differentiation antigens and natural killer cells, increased cortisol, increased IL-1 leading to an increase in glucocorticoids, and increased Th-1 pathway immune response. “Th1-type cytokines tend to produce the proinflammatory responses for killing intracellular parasites and for perpetuating autoimmune responses” (Berger, 2000, p. 424). The primary Th1 cytokine is interferon-gamma (Berger, 2000). As a result of these changes, there was an overall decreased incidence of ARVI, improved Disability Index Scores, reduced frequency and severity of illness, reduced ARVI and bronchitis, a correction of impaired immunological mechanisms, and extended remission times.

### ***Theme 3: The Influence of The Masgutova Method® on Physiological Markers***

The third theme emerging from The Masgutova Method® literature is the influence of The Masgutova Method® on physiological markers. The authors note a “trend toward homeostasis” (Diess et al., 2019, p. 49) in physiological measures, including bowel sounds, peak expiratory flow, pulse rate, and ocular pupil reactivity/ accommodation.

Diess et al. (2019) described physiological and reflex profiles, using comparative analysis, of 4 SGs. Participants’ ages ranged from 2 to 19 years old. SG1 ( $n = 49$ ) consisted of children with seizures, cerebral palsy, traumatic brain injury, and acquired brain injury. SG2 ( $n = 104$ ) consisted of participants with attention deficit disorder and attention deficit hyperactivity disorder. SG3 ( $n = 62$ ) consisted of individuals with anxiety, post-trauma, and post-traumatic stress disorder. SG 4 ( $n = 95$ ) consisted of children with autism spectrum disorder (ASD). CG1 ( $n = 241$ ) consisted of individuals with typical development. Objective measurement was obtained using a pre and post physical examination and the administration of the MNRI® Reflex Assessment (p. 36). This study explored changes following eight days of intensive “MNRI® reflex integration intervention” (p. 35) while attending an MNRI® Family Educational

Conference (p. 34-36). Objective measurements in the physical examination included all pulse measurements, blood pressure, pulse ox, peak flow, lung sounds, heart rate, bowel sounds, and PERLA. PERLA stands for Pupils Equal, Round, and Reactive to Light Accommodation (p. 36). Finally, the study explored the association between physical health measures and the level of reflex development.

Results of the physical marker panel revealed significant changes ( $\alpha = 0.05$ ) for each SG, as well as a collective measurement for “bowel sounds, peak expiratory flow, pedal dorsalis pulse, pedal tibial pulse, as well as ocular pupil reactivity and accommodation” (p. 40). Overall, the study showed positive effects in four major physiological systems, including the respiratory, cardiovascular, digestive, and nervous system, with a significant correlation to changes in reflex development ( $\alpha = 0.05$ ). The authors state changes in physiological markers and reflex development is dependent on the initial level of neurological dysfunction (p. 50). Overall, changes were described as a “trend toward homeostasis,” (p. 49) within body systems following intensive “MNRI® reflex integration intervention” (p. 35).

#### ***Theme 4: The Influence of The Masgutova Method® on Reflex Development***

Reflex pattern development is the next theme. Following intensive programs, study results have indicated the movement of reflex patterns along a continuum of reflex development in various populations. These have included: ASD, DS, and stress-related disorders. However, it should be noted that the psychometric properties of the reflex assessment tool utilized in these studies have not been published. Therefore, the validity and reliability of this tool is unknown.

Using the MNRI® Reflex Parameter Assessment, reflexes were scored on a continuum of dysfunctional to a level of high integration. Based on previous research, reflex development moved positively toward a higher level of integration following intervention using The

Masgutova Method®. Ultimately, the authors posit that movement along the reflex continuum influences overall development (Koberda & Akhmatov, 2016; Deiss et al., 2019; Masgutova, 2016; Shackleford et al., 2017; Masgutova et al., 2016b; Masgutova et al., 2016c; Masgutova et al., 2015; Masgutova et al., 2018).

Several published studies explored the use of The Masgutova Method® and DS, including a study examining the immunological influence of intervention, which was described in the immunological section of this paper. Masgutova et al. (2016a) examined the reflex profile of twenty-four reflexes and the development of children with DS, aged six months to 18 years SG ( $n = 48$ ), CG1 ( $n = 46$ ), CG2 ( $n = 780$ ) following an 11-day MNRI® Family Educational Conference. At pre-test, all reflexes tested in the SG and CG1 were either immature or dysfunctional (see **Appendix O** for a more detailed description of reflex development). Following intervention using The Masgutova Method®, the reflex assessment showed “significant positive changes in reflex patterns ... and improvement in their sensory-motor development overall [were] noted” (p. 7). In general terms, 45.83% of the reflexes tested moved to the next level of development as per the descriptions of the MNRI® Reflex Profile Assessment outlined in **Appendix O**. The authors did not identify the objective measurement tool used to measure changes in functional skills and development in the article.

### ***Theme 5: The Influence of The Masgutova Method® on Functional Skill***

#### ***Development***

The final theme is *The Influence of The Masgutova Method® on Functional Skill Development*. The literature has reported changes in *dynamic abilities*, including presence, postural control, balance, motor coordination, and cognitive development (Masgutova et al., 2016c; Masgutova et al., 2016b, Masgutova et al., 2015, Masgutova et al., 2018). However,

similar to the MNRI® Reflex Assessment, the psychometric properties of The Dynamic Skills & Abilities Questionnaire, used in several studies, have not been published. Therefore, the validity and reliability of this tool is also unknown. However, more recent publications have utilized published standardized assessments to measure changes in both visual processing skills, school performance, and early motor development (Masgutova et al., 2018, Renard-Fontaine, 2017). Diagnostic groups used in these studies have included children with DS and children with ASD.

Two studies evaluated reflex development before and after an 8-day MNRI® Family Educational program and qualitatively described dynamic changes in functional abilities. Each study consisted of a SG of children with ASD who received The Masgutova Method® and two CGs. The first CG included children with ASD but did not receive The Masgutova Method®. The second CG consisted of neurotypical children.

The first article described here, by Masgutova et al. (2016b) had a slightly higher sample population for the SG ( $n = 524$ ), CG1 ( $n = 94$ ), CG2 ( $n = 683$ ). Here the authors describe an improvement in reflex development, with additional qualitative changes in dynamic abilities. These qualitative changes in dynamic abilities included presence, postural control, behavioral control, tactile sensitivity, balance, motor coordination, and cognitive development. These findings were similar to the second article evaluating the efficacy of using The Masgutova Method® for children with ASD.

In the second article (Masgutova et al., 2016c), focusing primarily on ASD, the sample size was slightly smaller SG ( $n = 484$ ), CG1 ( $n = 72$ ), CG2 ( $n = 483$ ). Here all levels of severity made statistically significant improvements on the reflex profile. Specialized statistical analysis was applied, to determine statistical significance during the assessment.

Overall, 63.33% of reflexes assessed changed. Changes in reflex status were, in part, dependent on age, as younger children, aged 0-12 YO, made the greatest changes. The primary investigators suggest this offers support for early intervention in ASD. In this study, changes were less dependent on the severity of symptoms, as all levels of severity demonstrated significant change. Additionally, The Questionnaire of Dynamic Changes of Children's Ability was used to qualitatively describe changes observed in the study group along 10 clusters, including (a) "sensory-motor coordination and integration"; (b) "behavior regulation and self-protection"; (c) "emotional regulation"; (d) "self-awareness"; (e) "sociability/interaction"; (f) "stress vulnerability and resilience"; (g) "physical health"; (h) "speech and language"; (i) "cognitive processes and learning"; and (j) "motivation for achievement and learning" (p. 7). Although the reliability and validity of this test are not published, the authors used an ANOVA analysis and the Mann-Whitney U ( $p < 0.05$ ) to evaluate data from this questionnaire (Masgutova et al., 2016c).

The article by Masgutova et al. (2015) proposed that 'neuro-deficits' in DS are not static and are influenced by changes in the reflex profile of children with DS. The sample size in this study was slightly larger SG ( $n = 50$ ), CG1 ( $n = 46$ ), and CG2 ( $n = 780$ ). The age range of participants remained consistent from the previous study (6 months to 18 years), and each participant completed eight days of MNRI® Family Educational Conference (p. 3). Statistical analysis ( $p < 0.05$ ) revealed that 83.3% of the reflexes studied showed significant change. Although children with more significant impairments showed less change, all subgroups of children improved. Age was also a significant factor, as children aged six months to twelve years made the most improvements. The article outlined qualitative changes in developmental skills.

In 2018, Masgutova et al. published an article focused on visual processing skills and ASD. This study aimed to explore the effectiveness of MNRI® Visual Reflex Neuro-training (VRNT), using a Visual Reflex Assessment (VRA), visual skills assessment (VS), and Standard School Performance Test (SPT). According to the authors, the SPT includes reading and writing for 5 minutes with a comparison against age and skill norms. A study group ( $n = 240$ ) consisted of children, with ASD, who received eight sessions of VRNT during the context of an MNRI® Family Educational conference, over eight days. CG1 consisted of 120 children with ASD that did not receive MNRI® VRNT and a neurotypical CG2 ( $n = 260$ ).

Following the 8-day training, the study group demonstrated improvement in five out of the seven visual reflexes addressed, as measured by the MNRI® Reflex Development Assessment ( $p < 0.05$ ). These included visual convergence/divergence, horizontal eye tracking, ocular-vestibular reflex, and optokinetic reflex. In addition, the authors reported changes in functional skills. Academic skills scores improved for the SG, 43.33% for reading and 33.75% for writing. Although changes observed in the SG were related to visual skills, it is important to note they received five additional sessions per day of other programs in The Masgutova Method®, other than MNRI® VRNT.

### **The Masgutova Method® Literature: Strengths, Limitations, Knowns, & Gaps**

Overall, The Masgutova Method® can be described as a research emergent area. In summary, the available empirical evidence represents a strong effort from a small community of researchers with knowledge of The Masgutova Method® to build the research base and support evidence-based practice. Strengths of the current research include the introduction of neurophysiological measures (i.e., brain mapping, neurotransmitters, evoked brain potentials,

immunological markers, and physiological changes), as well as functional assessments used to explore changes in developmental domains (i.e., social, emotional, communication, fine/gross motor, and adaptive skills), academic skills, and visual processing skills.

### ***The Masgutova Method® Literature: Limitations***

Evidenced-based practice, utilizing The Masgutova Method®, would be enhanced by publishing the psychometric properties of the Reflex Development Assessment, utilization of more diverse standardized assessments of functional skills, longitudinal studies, and large scale randomized controlled studies by independent researchers. One current limitation, of the existing research studies, is the difficulty in reproducing and replicating the treatment. This limitation can be attributed to several factors. First, the intervention received by participants at an MNRI® Family Educational Conference is intervention research. Secondly, there is a relatively low number of MNRI® Core Specialists qualified to use The Masgutova Method® within a treatment study. Following this, as scientists and researchers have peaked awareness and interest outside The Masgutova Method® community, it may be beneficial to develop a fidelity measure that would ensure certain program tenants are upheld during intervention research. Overall, an expansion of the two components of the research cycle, practice-based and evidence-based research (Cook & Cook, 2016), will prompt additional researchers to examine the effectiveness and efficacy of The Masgutova Method®.

Despite strong efforts to advance the empirical-based of The Masgutova Method®, considering the modest number of practitioners worldwide with training in this area, The Masgutova Method® lacks substantial high-level, validated, evidence-based research and high-level formalized practice-based evidence. Following this, many gaps remain for future study and

exploration. Next, a summary of the *Knowns* and *Gaps* of The Masgutova Method®'s currently available scholarly literature is presented.

### ***The Masgutova Method® Literature: Knowns***

The current empirical literature on The Masgutova Method® provides initial support that The Masgutova Method® serves as a *regulator* within the nervous system, as indicated by changes in brain mapping, QEEG, evoked brain potential, neurotransmitters, and stress hormones (Koberda et al., 2016; Deiss et al., 2019; Bell et al., 2019; Pilecki et al., 2012). Similarly, there is support for The Masgutova Method® as a *regulator* within the immune system, as indicated by changes in the regulation of T and B lymphocytes, natural killer cells, immunoglobulin levels, and cytokines (Akhmatova & Akhmatova, 2017a; Akhmatova & Akhmatova, 2017b; Akhmatova et al., 2015a; Akhmatova et al., 2015c; Masgutova et al., 2013; Akhmatova et al., 2015a). Additional findings include regulation of the HPA stress axis and parasympathetic/sympathetic homeostasis (Masgutova, 2016; Shackleford et al., 2017), improved functional skill development for individuals across developmental domains (Masgutova et al., 2016b; Masgutova et al., 2016c; Masgutova et al., 2015; Masgutova et al., 2018), and improved integration of “primary reflexes” along the reflex continuum (Koberda & Akhmatov, 2016; Deiss et al., 2019; Masgutova, 2016; Shackleford et al., 2017; Masgutova et al., 2016b; Masgutova et al., 2016c; Masgutova et al., 2016a; Masgutova et al., 2015; Masgutova et al., 2018).

### ***The Masgutova Method® Literature: Gaps***

Early research in The Masgutova Method® is promising, as it has identified the influence of The Masgutova Method® on several neurophysiological markers, the immune system, and functional skills. Despite this, the empirical literature on The Masgutova Method® is positioned

at the very beginning of the research curve. Therefore, many gaps currently exist that, if researched, would strengthen the empirical research base. Gaps in The Masgutova Method® literature include:

- Describe the experience of MNRI® Core Specialists, clients, and their families, regarding The Masgutova Method® and the perceived effectiveness of the intervention.
- Develop a diagnosis and an age-specific correlation between physiological and functional changes observed following intervention using The Masgutova Method®.
- Utilize correlational studies to examine factors impacting reflex development.
- Investigate the link between primary reflex movements with cognitive, behavioral, emotional, and motor development.
- Validate/publish the MNRI® Reflex Development Assessment
- Evaluate each program in The Masgutova Method®.
- Examine the benefit of each exercise within each program.
- Continue to explore the neurophysiological and biomechanical changes that occur as a result of The Masgutova Method®. For example, mapping specific reflex patterns, such as the hands pulling reflex.
- Improve research methodologies, specifically independent large-scale randomized controlled studies, utilizing standardized/validated pre and post-test measures.
- Develop a fidelity measure to ensure well-designed intervention studies.
- *\*Expand the overall empirical evidence base of The Masgutova Method® to foster evidence-based practice using this method.*

As mentioned previously, the health care industry, across many disciplines, consistently reports a gap between research and practice. The limited research base is one of the foremost

challenges of moving The Masgutova Method®'s evidence into practice. This research problem informed this research study. This research study focuses on *research* in The Masgutova Method®. ***More specifically, the study aims to establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice.***

The literature review for this study identified no scientific studies investigating evidence-based practice and research engagement of MNRI® Core Specialists. However, studies have been conducted in related disciplines. The literature examining the allied health professions, most similar to MNRI® Core Specialists, is reviewed here. These professions constitute a large portion of MNRI® Core Specialists' professional backgrounds. This evidence provides reference points from which to compare, contrast, and draw analogies of the study's findings against what is known in the literature.

Understanding current research findings in related health care professions helped shape the study's research questions and methodology. The following key terms were used to search the occupational therapy, physical therapy, speech language pathology, and allied health professional literature: *evidence-based practice, scholarship, scholarly practice, research productivity, research utilization, research competence, research capacity, research engagement behaviors, research orientation, scholarly production, research conduct, conducting research, research engagement, research attitudes, research knowledge, research practice, research experience, research interest, perceptions, and intention toward research.* Research emerging from this search formed the foundation for the supplemental literature review described below.

### **Thematic Analysis: What do we know about research from the related literature?**

Scholarly literature, examined here from related fields, explored the entire research continuum. Therefore, this review includes *information regarding evidence-based practice (EBP) (i.e., scholarly practice, research utilization) and research engagement (i.e., scholarship, research productivity)*. Six themes emerged from the thematic analysis of the related literature:

1. Research Knowledge and Skill
2. Attitude Toward Research
3. Research Practice
4. Facilitators and Barriers to Research
5. Research as a Professional Responsibility & Educational Standard
6. Education, Experience, and Research KAP

Together, these themes provided the basis for the sub research questions of the study.

#### ***Theme 1: Research Knowledge & Skill***

The first theme is *Research Knowledge & Skill*. Research knowledge and skill are frequently measured as part of research capacity and research competence. Participants from all three disciplines rated themselves as having a low to moderate research capacity, including research knowledge and research skills. However, research knowledge and skill variation were noted depending on professional role and educational degree.

Eller et al. (2003) assessed knowledge, attitude, and practices (KAP) of research across the research continuum (utilization of research and engagement in research) among nurses ( $n = 746$ ) and non-nurse allied health professionals ( $n = 208$ ), using the Nurses' Research KAP Survey (Research KAP Survey). Regarding research knowledge, the non-nurse allied health

professionals, which included occupational therapists, physical therapists, and speech language pathologists, among a larger group of allied health professionals, scored “low” for knowledge of “submitting a proposal to IRB, submitting for grant funding, getting administrative support, and writing up results for publication” (p. 167). However, non-nurse professionals indicated “high” research knowledge for identifying clinical problems.

Brown et al. (2010) explored research KAP and barriers of pediatric occupational therapists ( $n = 696$ ) to evidence-based practice and research utilization using the ‘Knowledge Attitude Practices of Research Survey’ (Research KAP Survey). Study participants were from Australia, the United Kingdom, and Taiwan. The overall scale score for research knowledge was “moderate” (p. 91).

Allied health professionals tend to report a greater ability to access and apply research findings in practice than in conducting research. For example, researchers examining participation, perception, attitude, and barriers among physical therapists, surveyed in the State of Kuwait ( $n = 122$ ), indicated that “the majority of the participants used research findings rather than actively conducting their own research” (Aljadi et al., 2013, p. 565). Similarly, a cross-sectional study of occupational therapists ( $n = 86$ ) in Queensland, Australia, explored research experience, support needs, and barriers to research using a survey questionnaire based on the Research Spider©. In this study, study participants reported having more experience with evidence-based practice and less experience conducting research. In addition, participants reported needing more support to conduct research than to apply evidence to their clinical practice. Support required for research-related activities was inversely related to research experience (Pighills et al., 2013, p. 3).

Research capacity was reported higher at an organizational and team level than at the individual level (Frakking et al., 2021; Crombie et al., 2021). Alison et al. (2017) examined factors influencing allied health professionals' research capacity in Australia using the Research Capacity in Context Tool. Allied health professionals ( $n = 276$ ) included physiotherapy, occupational therapy, and speech pathology among a larger group of allied health professionals. Individual domain scores were lower than both organization and team domains. Similarly, a systematic review of studies, published in England by Borkowski et al. (2016), also found that “allied health professionals perceive that their individual research skills are lower in comparison to their teams and organization” (p.294).

Research knowledge & skills can be a barrier to engagement (Pager et al., 2012). Pager et al. (2012) examined motivators and feasibility (facilitators & barriers) to building allied health professional ( $n = 85$ ) research capacity in Australia using the Research Capacity & Culture Survey. Occupational therapists, physiotherapists, and speech pathologists were included among a larger group of allied health professionals. In this study, 54% of the sample identified a “lack of skills for research” as a barrier to research (p. 56). The authors identified “skills and knowledge” as one of the four key themes to barriers to research (p. 56).

Physical therapists, surveyed in the State of Kuwait, also identified “skills and knowledge of doing research” as a barrier to research engagement (Aljadi et al., 2013, p. 561). A similar finding was identified among occupational therapists in Saudi Arabia ( $n = 89$ ) (Alshehri et al., 2019). In this study, research knowledge and skill were reported as a significant barrier to EBP (Alshehri et al., 2019).

## ***Theme 2: Attitude Toward Research***

*Attitude Toward Research* emerged as the second theme. “Attitude refers to inclinations to react in a certain way to certain situations; to see and interpret events according to certain predispositions; or to organize opinions into coherent and interrelated structures” (Badran, 1995, p. 9). Values, beliefs, emotions, and knowledge are inter-linked with attitudes (Launiala, 2009; Badran, 1995, p.9). Generally, allied health professionals (including OT, PT, and SL/P) have a positive view of EBP and research (Brown et al., 2010; Janssen et al., 2016; Stephens & Upton, 2012; Zipoli & Kennedy, 2005; Alshehri et al., 2019).

The literature examined for this review more frequently examined attitudes toward using research in practice than conducting research. For example, Alshehri et al. (2019) explored EBP in Saudi Arabian occupational therapy practitioners ( $n = 89$ ). A large majority of the study participants (79.8%), indicated a positive attitude toward EBP. In addition, there was a trend for academic occupational therapists to have a higher attitude score than clinicians among study participants, although the association was not statistically significant (p. 124).

In a Canadian academic health care network, occupational therapists and occupational therapy assistants were surveyed regarding research attitude, research barriers, and research facilitators to research utilization and conducting research. The survey included open and close-ended survey questions. In this survey, 96.7% of survey respondents indicated research was “important for professional practice” (Greenspoon et al., 2014, p. 9). Furthermore, the authors concluded that “despite limited experience, respondents expressed an interest in locating, reading and conducting research” (p. 9).

Karlsson & Törnquist (2007) surveyed Swedish occupational therapists regarding their perceptions, attitudes, intentions, and engagement in research. Two surveys ( $n = 425$ ,  $n = 442$ )

were distributed between 1997 and 2003. In this study, “occupational therapists considered research-related activities to be an important part of their development of the professional role and status” (p. 221). The study participants rated research activities related to EBP the highest. These included tasks such as applying research findings to improve practice and reading research to update knowledge (Karlsson & Törnquist, 2007).

Brown et al. (2010) explored research KAP and barriers of pediatric occupational therapists ( $n = 696$ ) to “evidence-based practice and research utilization” in Australia, the United Kingdom, and Taiwan using the Knowledge Attitude Practices of Research Survey (Research KAP Survey). The overall scale score for research attitude was “moderate” (p. 91). Using the same instrument, Eller et al. (2003) reported a high willingness to engage (i.e., research attitude) in research among a non-nurse allied health professional group ( $n = 208$ ).

Similarly, the physical therapy literature also indicates a positive attitude toward research. For example, in 2013, researchers explored participation, perception, attitude, and barriers to research among physical therapists in the State of Kuwait ( $n = 122$ ). Similar to the literature in occupational therapy, physical therapists surveyed in this study had a positive attitude toward research (Aljadi et al., 2013).

Similar to OTs and PTs, SLPs also tend to have a positive attitude toward research, and a gap between evidence and practice persists (Stephens & Upton, 2012; Zipoli & Kennedy, 2005). For example, Stephens & Upton (2012) completed a systematic review of speech-language pathologists' understanding and integration of evidence into practice. Although the authors found a positive attitude toward EBP, the translation of evidence into practice was reportedly minimal.

Zipoli & Kennedy (2005) also reported “generally positive attitudes toward research and evidence-based practice” (p. 212). Study participants ( $n = 240$ ) were both speech-language pathologists (SLPs) and members of the American Speech & Hearing Association (ASHA). This study examined attitudes, utilization, and barriers to evidence-based practice ( $n = 240$ ) using a 4-part questionnaire. In addition, exposure to research and EBP during educational and clinical training was an important factor in research attitude.

A positive attitude toward research has also been noted in early career development. For example, a study exploring speech therapy students ( $n = 31$ ) in Saudi Arabia found a positive attitude toward research during their undergraduate studies (Alhaidary, 2019). This study utilized the 32-item version of the Attitude Toward Research Scale© (p. 711).

### **Research Self-Efficacy.**

*Research self-efficacy* is described as “individuals’ belief in their ability to perform certain tasks such as conducting sound empirical research and disseminating research findings” (Lambie et al., 2014b, p. 142). Individuals’ confidence in their research can play a significant role in research engagement (Lambie et al., 2014b; Finch et al., 2013). Although outside the OT, PT, and SL/P literature, Lambie et al. (2014b) found “found higher levels of research self-efficacy score were predictive of higher interest in research and research knowledge” (p. 139) in education students. Similarly, a study by Wenke et al. (2020) explored factors influencing allied health professionals ( $n = 21$ ) using a qualitative approach. Enablers to research identified by study participants included: (a) belief that one “has the capability to engage in research,” and (b) confidence “to undertake research with support” (Wenke et al., 2020, p. 5).

A lack of confidence in research ability among allied health professionals has been described as a barrier to research. Cordrey et al. (2022) explored allied health professionals'

research capacity and culture ( $n = 93$ ) using a mixed-methods approach in the United Kingdom. Study participants included physiotherapists, speech and language therapists, occupational therapists, dieticians, and support staff. Using the Research Capacity and Culture Tool (RCC) and focus groups, “fear of getting it wrong” was identified as a barrier to research participation (p. 5).

Formalized research training has been found to improve research efficacy. Although outside the OT, PT, and SL/P literature, Davidson & Palermo (2015) examined research competency in undergraduate dietetics and nutrition students following a two-year enhanced research methodology course curriculum. Study participants indicated a slight improvement in “self-perceived competence” as measured by the Research Skills Questionnaire (p. 3). Similarly, Lachance et al. (2020) identified the “importance of explicit training” (p. 1) to improve research self-efficacy in bioscience doctoral students ( $n = 100$ ).

### **Research Motivation.**

Understanding *research motivation*, a multifaceted construct, is an important factor contributing to research engagement. “Motivation can be thought of as one’s desire for (or aversion from) an outcome, with varying underlying purpose(s) which make the pursuit of the outcomes more or less likely” (Alamri et al., 2021, p. 189). For example, in a systematic review of research published in England, research motivators among allied health professionals (AHP) included “developing skills, increasing job satisfaction, and career advancement” (Borkowski et al., 2016, p. 294).

Using The Research Capacity and Culture (RCC) Tool, researchers identified four motivators to research among Australian AHP. These included: (a) “developing skills,” (b) “career advancement,” (c) identifying problems needing change, and (d) keeping the brain

stimulated (Frakking et al., 2021, p. 2761). A similar study by Crombie et al. (2021) examined research capacity and culture in a regional Australian health workforce ( $n = 80$ ). The study sample included physiotherapy, occupational therapy, and to a lesser extent, speech therapy among a larger group of allied health professionals. Again, developing skills was the highest-rated research motivator (p. 397).

Similarly, Cordrey et al. (2022) explored allied health professionals' research capacity and culture ( $n = 93$ ) using a mixed-methods approach in the United Kingdom. Study participants indicated “develop skills, advance career, increase job satisfaction, keep brain stimulated and increase credibility” as research motivators (p. 5).

Improving patient care has also been identified as a research motivator. For example, a thematic analysis of a regional Australian allied health workforce ( $n = 80$ ) identified improving service delivery as a research motivator (Crombie et al., 2021, p. 400). Improve patient care was also identified as a motivation to enter an academic career among nurses, midwives, and allied health professionals (NMAHPs). For example, Trusson et al. (2019) identified improving patient care, personal development, and career development as research motivators among NMAHPs ( $n = 67$ ) in the East Midlands region of England.

The literature has identified both intrinsic and extrinsic research motivators. For example, in Queensland Health, Australia, AHP ( $n = 85$ ) was more likely to identify intrinsic factors, such as interest in research, as research motivators (Pager et al., 2012, p. 53). Looking outside allied health professionals, Alamri et al. (2021) explored intrinsic and extrinsic motivators for research and research engagement by medical students ( $n = 348$ ) in New Zealand. In this study, extrinsic motivation had a bigger impact on self-reported research engagement than intrinsic motivators. Extrinsic motivators included building professional experience, financial, publication points, and

influence on future employment. Intrinsic motivators included interest in a research topic, inspiration, passion, enjoyment, continual learning, and research interest (p. 191).

### ***Theme 3: Research Practice***

Despite being a core standard for health professionals, and the tendency for a positive attitude toward research, few health practitioners conduct research (Davidson & Palermo, 2015; Stephens et al., 2009; Pitout, 2013). Previous research has identified a lack of involvement of allied health professionals in research (Greenspoon et al., 2014). *Research practice*, the third theme emerging from the literature, revealed low levels of research experience. Research practice demonstrates knowledge and attitude in action (Kaliyaperumal, 2004). Cordrey et al. (2022) explored allied health professionals' research capacity and culture ( $n = 93$ ) using a mixed-methods approach in the United Kingdom. More than 50% of the study participants indicated that they are not currently participating in research (p. 4).

Ried et al. (2006) explored research experience and interest using a modified *Research Spider*® among primary care physicians and allied health professionals ( $n = 89$ ) in Australia. Respondents reported little to moderate research experience in seven out of ten core research areas. However, study participants did indicate a high interest in research skill development.

A cross-sectional study of occupational therapists ( $n = 86$ ) in Queensland, Australia, explored research experience, support needs, and barriers to research (Pighills et al., 2013). “For later steps along the research continuum, from generating research ideas to publishing research, occupational therapists were significantly more likely than not to indicate that they had little or no experience ( $P < 0.0001$ )” (p. 4). Furthermore, their experience level “reduced incrementally along the continuum” (Pighills et al., 2013, p. 4). “Fourteen percent of study participants had

published clinical or research papers in peer-reviewed journals” (p.3). Additionally, 84% of study participants indicated they “were interested in undertaking researching the future” (p. 3).

Karlsson & Törnquist (2007) surveyed Swedish occupational therapists regarding their perceptions, attitudes, intentions, and engagement in research. Two surveys ( $n = 425$  &  $n = 442$ ) were distributed between 1997 and 2003. "Presently engaging in and initiating research" was rated lowest by survey participants (Karlsson & Törnquist, 2007, p. 224). Study participants ranked reading research and applying research findings to improve practice as the first and second most important activities. The authors also reported a trend related to age and practice setting. Younger occupational therapists indicated more intention to participate in research than older therapists. Regarding practice setting, hospital-based therapists were more active in research than those in primary care (p. 227).

Greenspoon et al. (2014) surveyed occupational therapists and occupational therapy assistants in a Canadian academic health network using a 16-question survey. 71.6% of survey respondents indicated having "limited or no experience with conducting independent research" (p. 9). Fifty-seven percent of study participants indicated "having participated in research as a degree requirement" (p. 9). Similarly, among physical therapists ( $n = 122$ ) surveyed in Kuwait, only 17% of physical therapists surveyed reported participation in clinical research (Aljadi et al., 2013, p. 561).

A qualitative study by Decullier et al. (2021) explored “representations of research among newly graduated paramedical professionals” in France (p. 1). Study participants reported interest in accessing and using research in practice but less confidence and motivation to "generate evidence themselves" (p. 1). Professions included in the paramedical group included speech therapy, occupational therapy, and physiotherapy, among other professional groups.

Cordrey et al. (2022) explored allied health professionals' research capacity and culture ( $n = 93$ ) using a combination of the Research Capacity and Culture Questionnaire and focus groups. The study identified motivators and barriers to the research engagement of allied health professionals in the United Kingdom. The sample included dietitians, physical therapists, speech-language pathologists, and occupational therapists. More than half of the study sample reported no current involvement in research activities.

Using the *Wessex Research Network Spider*®, researchers examined the effect of an "Allied Health Clinical Research Office" (p. 56) among Australian Allied health professionals in 2007 and 2015 ( $n = 132$ ,  $n = 245$ ). Overall, study participants indicated having "some research interest" and "little research experience" (p. 46). However, research participation did increase from 2007 to 2015. In 2007, 41% of study participants identified as participating in research. In 2015, 51% indicated involvement in research. Occupational therapists, speech therapists, and physical therapists were among the allied health professionals surveyed (Taylor et al., 2019).

Upton et al. (2014) revealed that few occupational therapists conduct research despite positive attitudes towards EBP (p. 35). Similarly, Waine et al. (1997) examined research participation among occupational therapists ( $n = 293$ ) in Alberta, Canada. Approximately 30% of study participants indicated being active in research (Waine et al., 1997). Morris & Smyth (2017) found slightly better research engagement. In a study of research capacity and partnerships among mental health occupational therapists in the United Kingdom, almost half of the participants have conducted research over the past five years.

Brown et al. (2010) utilized a cross-cultural design to explore research knowledge, attitudes, and practices of EBP and research utilization among pediatric occupational therapists ( $n = 69$ ). Study participants practiced in Australia, the United Kingdom, and Taiwan. The overall

scale score for research practice on The Knowledge Attitude Practices of Research Survey (Research KAP Survey) was "moderate" for research practice.

Overall, applying evidence in practice is more frequently reported in the literature than actual participation in the research process (Waine et al., 1997; Morris & Smyth, 2017; Aljadi et al., 2013). For example, Australian allied health professionals ( $n = 76$ ) reported that the organization "promoted clinical practice based on evidence" (p. 2759) as the highest domain response on the Research Culture and Capacity Tool. Yet, despite this finding, seventy-seven percent of the study participants indicated they were not currently involved in research (Frakking et al., 2021).

Although the application of evidence in practice is reported more frequently than research participation, evidence-based practice is still developing in allied health care professionals. For example, in 2019, Alshehri et al. (2019) explored "decision-making preferences, attitudes, awareness, and barriers in relation to evidence-based practice implementation in Saudi Arabia" among occupational therapy practitioners ( $n = 89$ ). In this cross-sectional survey design, 53.9% of participants indicated having no formal training in EBP (p. 121). Seventy-three percent of the study's sample consisted of bachelor trained therapists. Similarly, in a survey of Canadian Occupational therapists, 73.1% of study participants indicated "some proficiency with searching, reading and evaluating literature" (Greenspoon et al., 2014, p. 9).

Using The Nurses' Research Knowledge, Practices, and Attitude of Research Survey (Research KAP Survey), Eller et al. (2003) reported: "high" research practice scores among non-nurse health professionals for evidence-based practice skills such as "identifying clinical problems, identifying information from the literature and participating in the design of interventions" (p. 167). In this study, both nurses and non-nurse health professionals reported

"low" research practice for "administering research implementation" (p. 167). In this sample, gender, research knowledge, and research attitude accounted for 71% of the variance for the "ability to perform" research (Eller et al., 2003, p. 167).

Similarly, allied health professionals in Australia ( $n = 132$ ) report research experience and interest using the *Wessex Network Research Spider*®. The sample included occupational therapists, physical therapists, speech-language pathologists, dietitians, podiatrists, and other clinicians. Generally, the participants of this study reported little research experience. Although research interest was higher than research experience, research interest among study participants remained low (Stephens et al., 2009).

Pighills et al. (2013) conducted a cross-sectional survey of research experience among Australian occupational therapists ( $n = 86$ ). Using a modified and expanded version of the *Research Spider*®, the authors explored research experience across the research continuum. Study participants indicated a high interest in research and limited research experience (p. 6). Research experience was inversely related to support needed for research activities required for tasks at the beginning of the research continuum. Even occupational therapists with higher research experience require support for more complex research tasks (p. 3-4).

Allied health faculty have also reported low research engagement. For example, Gupta & Bilics (2014) reported on scholarship and research in occupational therapy education among occupational therapy faculty ( $n = 450$ ). Although 90% of study participants reported using research to guide teaching practice, only 16% reported being "frequently engaged" in research, 29% of study participants indicated "occasional involvement," and 55% indicated "having never or seldom" engaged in research (p. S89).

#### ***Theme 4: Facilitators and Barriers to Research***

Research engagement is "a complex task and requires development of new knowledge and capabilities" (Wenke et al., 2020, p. 1). The development of a robust evidence base depends on clinician-investors' research activity. However, the feasibility of research engagement is dependent on barriers and facilitators to research. The research examining the range of research in occupational therapy, physical therapy, and speech-language pathology identified many facilitators and barriers to evidence-based practice and research (Salls et al., 2009; Pitout, 2013; Di Bona et al., 2017; Birken et al., 2017; Ballin et al., 1980). Therefore, *facilitators and barriers* emerged as the 4<sup>th</sup> theme in this supplementary literature review. Although enabling factors were sometimes described, barriers were more frequently identified. The research reviewed here identified barriers on multiple levels, including intrapersonal, interpersonal, and organizational. Additionally, the barriers and facilitators described in the literature reviewed here were more frequently related to applying research in practice. The literature reviewed here was less likely to discuss barriers and facilitators to research (i.e., research engagement).

A systematic review of the literature published in England identified the three most prevalent barriers to research among allied health professionals. Barriers identified included "lack of time, limited research skills, and other work roles taking priority" (Borkowski et al., 2016, p. 294). Similarly, a survey of Australian allied health professionals ( $n = 76$ ) working with women, children, and families in a public hospital system identified lack of time, other work roles, and lack of skills as the three top barriers to research engagement (Frakking et al., 2021). The study sample included medical, nurses, allied health professionals, and midwives. Researchers used The Research Capacity and Culture (RCC) Tool as the primary outcome measure in this study.

Using a mixed-methods approach, researchers examined “the challenges and benefits of clinical academic careers for nurses, midwives, & allied health professionals (NMAHPs)” in the East Midlands region of England ( $n = 67$ ) (Trusson et al., 2019, p. 4). Study participants indicated research motivation, funding, and maintaining a clinical vs. researcher role as barriers to clinical academic careers. Conversely, the benefits of clinical academic careers include having an impact on patients and influencing peers and colleagues (p. 4-7).

Pager et al., 2012 explored "motivators, enablers, and barriers to building allied health research capacity" (p. 53) among allied health professionals ( $n = 85$ ) in Queensland, Australia, using the Research Capacity and Culture Survey (RCC). Barriers to research identified by study participants included workload and lack of time (p. 53). The study participants also identified research motivators (described previously). Research enablers included: (a) links to universities, (b) mentorship, (c) dedicated time, and (d) grant funds (p. 56).

Greenspoon et al. (2014) explored research in Canadian occupational therapists. In this study, study participants identified time as the most significant barrier to research. Additional barriers included (a) employment status, (b) lack of skill/knowledge, (c) funding, (d) statistics, (e) difficulty evaluating current evidence, (f) inexperience and fear, and (g) understanding the research process. Facilitators for research engagement included (a) time, (b) active learning, (c) research skills, (d) mentorship, (e) funding, and (f) time to discuss articles with peers.

A study by Birken et al. (2017) explored barriers and facilitators to participation in "intervention research" (p. 568) among occupational therapists in England working in mental health using a fixed and open-ended survey questionnaire. Intervention research "rel[ies] on the existing occupational services to implement the intervention in clinical practice within the randomized controlled trials (RCT)" (p. 568). Study participants identified (a) paperwork, (b)

recruitment challenges, and (c) difficulty integrating a research study into clinical practice as barriers to intervention research. Facilitating factors included (a) attitudes toward research, (b) allotted time, (c) research motivation/interest, (d) organizational/leadership support, (e) communication with other researchers and therapists involved in the intervention research, and (f) links with academic institutions (p. 571).

Using a qualitative design, Di Bona et al. (2017) explored enablers and challenges to occupational therapists' ( $n = 28$ ) engagement in the "Valuing Active Life in Dementia" research program using focus groups. Study participants described research challenges as (a) overwhelming paperwork, (b) delivering a new intervention, (c) videos, and (d) recruitment (p. 645). In addition, research enablers included: (a) peer support, (b) management support, (c) protected time, and (d) positive attitudes toward research (p. 642).

In a study by Aljadi et al. (2013), physical therapists in Kuwait identified caseload, lack of time, and resources as the primary barriers to research participation. Participants were more likely to read evidence-based practice and apply it than actively engage in research. However, even using evidence in practice is limited among related health care professionals. Salls et al. (2009) explored evidence-based practice by occupational therapists ( $n = 930$ ). Just under a quarter of study participants (24.2%) frequently indicated "us[ing] professional literature and research findings for clinical decision making" (p. 140).

Brown et al. (2009) explored "knowledge, attitude, practices, and barriers of pediatric occupational therapists to evidence-based practice and research utilization" (p. 38). This cross-cultural study included participants from Australia, the United Kingdom, & Taiwan ( $n = 696$ ). The study questionnaire included three instruments (a) Research knowledge, Attitudes and Practices of Research (Research KAP Survey), (b) The Barriers to Research Utilization Scale,

and (c) the Edmonton Research Orientation Survey (p. 45). Barriers to research utilization included (a) organizational, (b) communication, and (c) innovation (p. 43).

Using a mixed-methods approach, perceptions of New Zealand physiotherapists ( $n = 25$ ) toward "implement[ing] research in their daily practice and becom[ing] involved in research" were examined using in-depth interviews and a series of three questionnaires (i.e., demographics, Edmonton Research Orientation Survey, and a measure of research confidence and motivation using a visual analog scale) (p. 210). Overall, study participants reported a positive attitude toward research. However, barriers to engagement included time, the relevance of academic research in their clinical practice, and the availability of research. In this study, time was the biggest barrier to research engagement (Janssen et al., 2016).

Eller et al. (2003) used the Nurses' Research KAP Survey (Research KAP Survey) for nurses ( $n = 746$ ) and non-nurse allied health professionals ( $n = 208$ ). Study participants identified barriers to their "willingness to engage in research" as research skill, organizational characteristics, resources, and research support (Eller et al., 2003, p. 169). The non-nurse allied health professional group included physical therapy, occupational therapy, and speech-language therapy.

Stephens & Upton (2012) completed a systematic review of speech-language pathologists' understanding and integration of evidence into practice. Barriers to EBP included research resources such as time and relevance of the evidence to practice (p. 332). In addition, speech therapists report limited skills in accessing an already limited evidence base.

Cordrey et al. (2022) explored the research capacity and culture of AHPs ( $n = 93$ ) using the Research Capacity and Culture Questionnaire and focus groups designed to identify motivators and barriers to research engagement of allied health professionals in the United

Kingdom. The sample included dietitians, physical therapists, speech-language pathologists, and occupational therapists. Participants identified organizational strengths related to evidence-based practice (EBP), including "promoting clinical practice based on evidence, ensuring planning is guided by evidence, encouraging research activities relevant to practice, and having senior managers that support research" (p. 3). Organizational weaknesses included research resources such as statistical analysis software, money, equipment, organizational research support, and access to external funding. On an individual level, participants identified research skills related to scholarship as a weakness. Research skills included securing funding, completing ethics applications, developing a research design, scientific writing for publication, and mentoring others. More than half the study sample reported no current involvement in research activities.

Alshehri et al. (2019) explored decision-making preferences, attitudes, awareness, and barriers to evidence-based practice among occupational therapists ( $n = 89$ ) in Saudi Arabia. Forty-five percent of study participants indicated a "lack of teaching [of evidence-based practice and research] in previous education" (p. 126) as the most significant barrier. Additional barriers included resources, competence, time, organizational support, and research interest.

Samuelsson & Wressle (2015) conducted a cross-sectional descriptive study of Swedish occupational therapists ( $n = 472$ ). Using the Barriers to Research Utilization Scale, the authors identified three significant barriers to research utilization. Barriers included: "facilities are inadequate for implementation" (p. 177); "statistical analysis are not understandable" (p. 177); and "I do not have time to read research" (p.177)

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Barriers to applying available evidence to practice include lack of skills, overall poor quality of research studies/methodological inadequacies, work culture, and lack of time (Zipoli & Kennedy, 2005; Stephens & Upton, 2012; O'Connor & Pettigrew, 2009; Pennington, 2001). One facilitator to EBP is exposure to research during educational training (Stephens & Upton, 2012).

In southern Ireland, speech and language therapists ( $n = 32$ ) identified barriers to research implementation for evidence-based practice (O'Connor & Pettigrew, 2009). Seventy-two percent (71.9%) of the study participants indicated a "lack of time to read research" (p. 1018) as a barrier to evidence-based practice on the BARRIERS scale. Additional barriers included methodological inadequacies, workplace, research skills related to evidence-based practice, and time to implement a new intervention (p. 1018).

Pennington (2001), who also used the BARRIERS scale, explored attitudes to and use of research among speech and language therapists ( $n = 193$ ) in England. Time to read and implement research findings were the most significant barriers to EBP among study participants. Additional barriers included organizational barriers, access to research, quality and applicability of research findings, and attitude toward research (p. 376). Facilitators to research included time, access to research, training, funding, and research culture (p. 378).

**Table 3** provides a summary of the barriers identified in the literature.

**Table 3***Barriers to Evidence-Based Practice & Research*

Barrier	Supporting Citations
Time	Greenspoon et al., 2014; Karlsson & Törnquist, 2007; Aljadi et al., 2013; Crombie et al., 2021; Borkowski et al., 2016; Pager et al., 2012; Cordrey et al., 2022; Pighills et al., 2013; Alshehri et al., 2019; Golenko et al. 2012; Birken et al., 2017; Janssen et al., 2016; O'Connor & Pettigrew, 2009; Stephens & Upton, 2012; Pennington, 2001; Kamwendo, 2002;
Knowledge & Skill	Greenspoon et al., 2014; Karlsson & Törnquist, 2007; Aljadi et al., 2013; Borkowski et al., 2016; Alison et al., 2017; Alshehri et al., 2019; Birken et al., 2017; O'Connor & Pettigrew, 2009; Stephens & Upton, 2012; Eller et al., 2003; Kamwendo, 2002;
Funding	Greenspoon et al., 2014; Trusson et al., 2019; Alison et al., 2017; Cordrey et al., 2022; Alshehri et al., 2019; Pager et al., 2012; Pennington, 2001; Kamwendo, 2002;
Mentorship	Greenspoon et al., 2014
Workload/Other Work	Karlsson & Törnquist, 2007; Aljadi et al., 2013; Borkowski et al., 2016; Pager et al., 2012; Cordrey et al., 2022; Di Bona et al., 2017; Birken et al., 2017; Pighills et al., 2013; Kamwendo, 2002;
Priorities/Staffing	Karlsson & Törnquist, 2007; Alison et al., 2017; Janssen et al., 2016; Eller et al., 2003
Organizational Factors/ Leadership	Karlsson & Törnquist, 2007
Family Level Factors/ Research Support	Karlsson & Törnquist, 2007
Personal Priority	Karlsson & Törnquist, 2007
Resources	Aljadi et al., 2013; Frakking et al., 2021; Alison et al., 2017; Alshehri et al., 2019; Birken et al., 2017; Stephens & Upton, 2012; Eller et al., 2003;
Recruitment	Di Bona et al., 2017
Concept of Research/Application of Research to Practice/Quality of available literature	Janssen et al., 2016; O'Connor & Pettigrew, 2009; Stephens & Upton, 2012
Family situation/work-life balance	Kamwendo, 2002
Training	Pennington, 2001

**Table 4** provides a summary of barriers identified in the literature.

**Table 4**

*Facilitators to Evidence-Based Practice & Research*

Facilitator	Supporting Citations
Time	Greenspoon et al., 2014; Pager et al., 2012; Di Bona et al., 2017;
Research Skill Training	Greenspoon et al., 2014
Mentorship	Greenspoon et al., 2014; Pager et al., 2012
Resources/Funding	Greenspoon et al., 2014; Pager et al., 2012;
Link to Academic	Pager et al., 2012; Birken et al., 2017
Institutions	
Organizational Support/ Leadership	Di Bona et al., 2017; Birken et al., 2017
Supportive Research Culture	Pennington, 2001
Peer Support	Di Bona et al., 2017
Positive Attitude to Research	Di Bona et al., 2017; Pennington, 2001
Research Interest/ Research Motivation	Birken et al., 2017
Communication	Birken et al., 2017

***Theme 5: Professional Responsibility & Educational Standards***

Another commonality between all three disciplines was the shared professional value placed on the full range of research activities. All three disciplines emphasized research in their educational curriculum and accreditation standards (Abreu et al., 1998; Accreditation Council for Occupational Therapy Education [ACOTE], 2018; American Physical Therapy Association

[APTA], 2019; Council on Academic Accreditation, 2022). The 5<sup>th</sup> theme emerging from the literature is *professional responsibility & educational standards*.

The American Occupational Therapy Association recognizes a “range of scholarly activities” as a “professional responsibility,” which includes both applying research to clinical practice and active engagement in research (American Occupational Therapy Association [AOTA], 2016, Supplement 2, p. 1). Abreu et al. (1998) assert that the “capacity of therapists to achieve competence in scientific inquiry and research” is necessary for the “survival and expansion of the profession of occupational therapy (p. 751). The Accreditation Council for Occupational Therapy (ACOTE) Standards for Education emphasizes the importance of developing skills needed to be an “effective consumer of the latest research and knowledge bases that support occupational therapy practice and contribute to the growth and dissemination of research and knowledge” for masters and doctoral degree programs (Accreditation Council for Occupational Therapy Education [ACOTE], 2018, p. 3).

Similar to the call for a ‘range of research’ engagement within the occupational therapy profession, the American Physical Therapy Association (APTA) emphasizes engagement with research across the continuum.

The American Physical Therapy Association (APTA) supports rigorous scientific inquiry as an essential requisite for developing and advancing the physical therapy profession. Research in physical therapy focuses on creating an evidence-based body of knowledge to advance practice and education, shape health policy, maximize integrity of service delivery, and promote positive health of people worldwide. (American Physical Therapy Association [APTA], 2019, p.1)

The call for research in physical therapy has spanned several decades. In the Mary McMillan lecture series in 1975, Helen Hislop articulated that “the determination of the profession to retain a viable place in the health care system with a vigorous economic-based compatible with the nation’s resources and to improve the quality of patient care must, for the indefinite future, necessitate a large, continuing research and development enterprise” (Hislop, 1975, p. 1076). Following this, the physical therapy profession has emphasized the role of research in physical therapy education and academic faculty. In 2020, the Commission on Accreditation in Physical Therapy Education (CAPTE) required doctoral preparation for all core faculty and academics to have a “well-defined, ongoing scholarly agenda” (p. 12). In addition, to maintain accreditation, at least 50.0% of core faculty are required to have an advanced research degree beyond the DPT (CAPTE, 2020, p. 16).

The importance of research across the research continuum is also evident in the professional literature for speech-language pathologists. For example, initiatives in Australia have encouraged speech-language pathologists (SLP) to be research generators and not just research consumers, prompting professionals to move across the research continuum (Finch et al., 2013). In addition, a position statement for “Evidence-Based Practice in Communication Disorders,” by the American Speech-Language-Hearing Association (ASHA), and the “Standards for Accreditation of Graduate Educational Programs in Audiology and Speech-Language Pathology,” by the Council on Academic Accreditation in Audiology and Speech-Language Pathology, were reviewed. The position statement for “Evidence-Based Practice in Communication Disorders” indicates that speech-language pathologists should “incorporate the principles of evidence-based practice in clinical decision making to provide high-quality clinical care” (American Speech-Language-Hearing Association [ASHA], 2005, para. 3).

The “Standards for Accreditation of Graduate Education Programs in Audiology and Speech-Language Pathology” emphasizes evidence-based practice and opportunities for research participation for educational accreditation of audiology and speech-language academic training. The standards for accreditation call for access to research, the ability to critically evaluate research, and the ability to integrate evidence into practice (p. 19). Standards support movement beyond becoming “knowledgeable consumers of research literature” and “knowledgeable about the fundamentals of EBP” to “include research and scholarship participation opportunities” (Council on Academic Accreditation in Audiology and Speech-Language Pathology, 2020, p. 24).

#### ***Theme 6: Experience, Level of Education, and Research KAP***

The final theme emerging from the literature is *experience, education level, and research KAP*.

##### *Education & Evidence-Based Practice*

“Education is the prerequisite of knowledge” (Badran, 1995, p. 9). The literature has identified an association between education and EBP. Using The Barriers to Research Utilization Scale, Samuelsson & Wressle (2015) found that Swedish “occupational therapists with higher educational levels indicated a higher use of research” (p. 175). Study participants with less advanced educational degrees indicated more years of professional experience and identified “significantly greater barriers” to evidence-based practice (p. 177).

In 2005, Cameron et al. explored the utilization of evidence-based practice among American registered occupational therapists ( $n = 131$ ). In this study sample, “significantly fewer registered occupational therapists utilized EBP in the intervention planning process when compared to those who did not” (p. 131). An inverse relationship was identified between

educational degree and perceived importance of using research in practice among study participants. This association means that as the educational degree increases, the perceived importance of research utilization decreases (p. 131). The same relationship between years of professional practice and “the use of research evidence in clinical practice” was reported (p. 131). As years of professional practice increased, “the use of research evidence in clinical practice” decreased (p. 131).

#### *Education & Scholarship*

Karlsson & Törnquist (2007) surveyed Swedish occupational therapists regarding their perceptions, attitudes, intentions, and engagement in research. Two surveys ( $n = 425$  &  $n = 442$ ) were distributed between 1997 and 2003. The authors noted that younger occupational therapists indicated the intention “to plan or do research” at a higher rate than older occupational therapists (p. 225).

Finch et al. (2013) explored factors influencing Australian speech-language pathologists' research engagement ( $n = 137$ ). In this study sample, “the independent variables that significantly predicted engagement in research were highest qualification obtained ( $p < .001$ ), current position classification level ( $p = 0.37$ ), and overall interest in research ( $p = .026$ )” (p.6). Overall, study participants indicated a moderate interest in research and low ratings for both levels of research experience and research confidence (p. 4).

#### *Education, Years of Experience, and Research KAP*

Eller et al. (2003) explored research knowledge, attitude, and practice in nurses ( $n = 538$ ) and allied health professionals ( $n = 208$ ). Study participants in the nurse group identified a significant relationship between education-research knowledge and education-research practice. However, the relationship between education and research attitude was not significant. For non-

nurse allied health professionals, no association between education and research knowledge, research attitude, or research practice was reported (p. 167). Among occupational therapists in Sweden, a higher degree was not associated with attitude toward research or research competence (Karlsson & Törnquist, 2007, p. 228).

Zipoli & Kennedy (2005) explored speech-language pathologists who were members of the American Speech & Hearing Association (ASHA) ( $n = 240$ ) attitude toward research. In this study, years of experience, highest educational degree, and “model of assessment” only minimally contributed to attitude toward evidence-based practice. Instead, the two most significant variables influencing attitude to research included exposure to evidence-based practice during educational and clinical training (p. 213).

Kamwendo (2002) explored Swedish Physiotherapists’ ( $n = 343$ ) perceptions, attitudes, intention to research, and research engagement. Overall, study participants had a positive attitude to research. “Therapists with additional university studies had a more positive attitude and rated their ability to perform higher than those with no additional experience” (p. 27).

### **Related Literature Limitations**

The related literature is not without limitations. Understanding these limitations is important to inform the literature reviewed for this study. Five limitations of the related literature include:

- Educational standards and entry-level degree requirements have evolved for allied health professionals.
- Variations in health care systems and professional training exist for international studies.

- The literature reviewed focuses heavily on evidence-based practice/scholarly practice. Following this, research focusing on research engagement was less frequently identified in the literature reviewed for this study.
- The literature reviewed here frequently groups occupational therapists, speech-language pathologists, and physical therapists with other allied health professionals.
- Publication date influences the potential relevance and ability to generalize to present-day occupational therapists, physical therapists, and speech-language pathologists.

### **Theoretical Lens**

Although not always explicitly stated, researchers used various theoretical perspectives to examine research knowledge, attitude toward research, and research practice. Theories and models identified in the literature included:

- *Knowledge Translation (KT)*
- *Socioecological Theory*
- *Banduras Self Efficacy Theory*
- *Knowledge Attitude Practice Model*

The Canadian Institute of Health Research defined *Knowledge Translation (KT)* as "the exchange, synthesis and ethically-sound application of knowledge- within a complex system of interactions among researchers" (Canadian Institutes of Health Research, as cited in Sudsawad, 2007, p. 1). Knowledge translation can bridge the gap between research knowledge and clinical practice (Sudsawad, 2007). Studies informed by KT included studies evaluating the translation of evidence into practice (Greenspoon et al., 2014). Guided by KT, Greenspoon et al. (2014)

explored attitudes toward research and research feasibility to research utilization and research engagement among Canadian occupational therapy staff at The University Health Network.

According to a social-ecological framework, research is influenced by the "interaction between, and interdependence of, factors within and across all levels" (U. S. Department of Health & Human Services, National Institute of Health, National Cancer Institute, 2005, p. 10). In this model, "behavior both affects, and is affected by, multiple levels of influence, ... [and] individual behavior both shapes, and is shaped by, the social environment" (U. S. Department of Health & Human Services, National Institute of Health, National Cancer Institute, 2005, p. 10). Studies exploring research culture and feasibility frequently identified barriers and facilitating factors on multiple levels as specified in the Social-Ecological Model. For example, Frakking et al. (2021) evaluated allied health professionals' research capacity and culture in an Australian public hospital. In this study, organizational, team, and individual research skills were rated by study participants using the Research Capacity and Culture Tool.

Self-efficacy is "confidence in one's ability to take action and overcome barriers" (U. S. Department of Health & Human Services, National Institute of Health, National Cancer Institute, 2005, p. 20). It is a stand-alone theory and a component of other theories and models. For example, both Social Cognitive Theory and Health Belief Model have a self-efficacy component (U. S. Department of Health & Human Services, National Institute of Health, National Cancer Institute, 2005, pp. 13-19). Across many professional health care disciplines, research engagement is considered low. Research self-efficacy is an important factor influencing research engagement (Lambie et al., 2014b). "Research self-efficacy specifically refers to beliefs about one's ability to carry out and complete tasks associated with research" (Bishop & Bieschke, 1998, as cited in Love et al., 2007). Following this, researchers interested in examining factors

related to research engagement have explored research self-efficacy. Although outside the OT, PT, and SL/P literature, Love et al. (2007) investigated the influence of early-career research experience on research self-efficacy among graduate psychology students.

For this study, the KAPM model was chosen as the most appropriate lens to establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude toward research, and research. In addition, this model had the most practical application to support the development of a research capacity-building program. Please refer to *Chapter 1* for a detailed description of the KAPM model, including strengths, weaknesses, and practical applications.

## **Research Design**

Researchers have used quantitative, qualitative, and mixed-methods designs to explore research knowledge, attitude and practice. A quantitative approach was common in the literature reviewed here when valid and reliable measurement tools were available to measure the domain or domains of interest. For example, Brown et al. (2009) conducted a quantitative study by using The Nurses Research KAP Survey, The Barriers to Research Utilization Scale (BARRIERS), and The Edmonton Research Orientation Survey to explore "knowledge, attitudes, practices, and barriers" to evidence-based practice and research utilization among a cross-cultural sample of pediatric occupational therapists (p. 38).

In the literature reviewed for this study, studies using a purely qualitative approach were less frequent than quantitative and mixed-methods approaches. In the literature reviewed, qualitative studies were more common for studies exploring feasibility of research, specifically barrier and facilitating factors to conducting research. For example, using grounded theory and content analysis, Miller et al. (2020) used interviews to evaluate a clinical academic research

internship among nurses, midwives, and AHP in England. Study participants identified barriers and facilitators to research. However, studies exploring barriers to only EBP more frequently utilized a quantitative approach. For example, The Barriers to Research Utilization Tool was a common tool used to measure barriers and facilitators to EBP (Samuelsson & Wressle, 2015).

In addition to using a qualitative approach to explore barriers and enablers to research, researchers have also used a qualitative approach to explore professionals' experiences participating in intervention research and research capacity-building programs. For example, using focus groups, Di Bona et al. (2017) explored enablers and challenges to occupational therapists' engagement in the Valuing Active Life in Dementia research program using focus groups. Also using a qualitative approach, Hilder et al. (2020) explored the outcomes of a research capacity-building initiative that provided funding for protected research time to promote research engagement among AHP in Australia using semi-structured interviews.

Mixed-methods designs, specifically survey research with open-ended questions, were frequently noted in the literature reviewed for this study (Cordrey et al., 2022; Birken et al., 2017). For example, Birken et al. (2017) explored barriers and facilitating factors to participation in intervention research in English mental health occupational therapists using data analysis derived from both quantitative and qualitative approaches. This study used an online survey that included fixed responses and open-ended questions. Also, using a mixed-methods approach, Cordrey et al. (2022) explored research capacity and culture for Allied Health professionals in the United Kingdom using a combination of questionnaires and focus groups.

A mixed-methods approach is appropriate for this study because of the ability to utilize different types of data to get a more detailed understanding of the topic. In this study, open-ended questions explored research feasibility. Using a mixed-methods design provided the

opportunity to contextualize MNRI® Core Specialists' research knowledge, attitude toward research, and research practice.

## Chapter III: METHODOLOGY

### Introduction

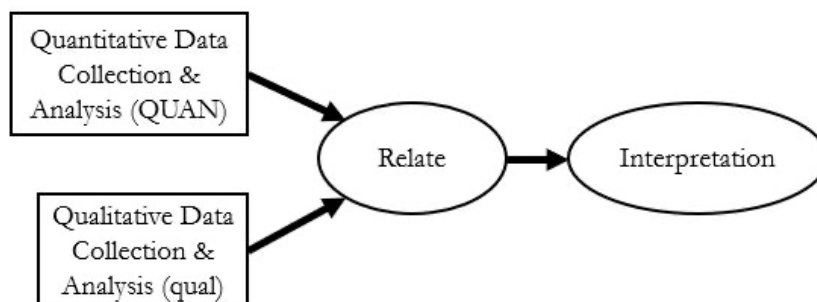
The purpose of this study was to explore MNRI® Core Specialists' research knowledge, attitude, and practice. A *modified* convergent parallel mixed-methods design (QUANT + qual) was selected (Creswell, 2014). In this study design, primarily quantitative data (QUANT) exploring research knowledge, attitude, and practices of MNRI® Core Specialists was collected simultaneously with three open-ended questions of the same participants (qual).

### Study Design

The study design was a non-experimental, descriptive, exploratory, correlational, and cross-sectional *modified* convergent parallel mixed-methods design (Creswell, 2014). In this approach, the "researcher collects both quantitative and qualitative data, analyzes them separately, and then compares the results to see if the findings confirm or disconfirm each other" (Creswell, 2014, p. 219).

**Figure 5**

*Schematic of Modified Convergent Parallel Mixed-Methods Design*



*Note.* The study emphasizes quantitative data that was further contextualized by qualitative data analysis. Adapted from "Research Design Qualitative, Quantitative, and Mixed Methods Approaches," by J. W. Creswell, p. 220. Copyright 2014 Sage Publications, Inc.

For this study, quantitative data regarding research knowledge, attitude, and practice was collected. The open-ended responses provided additional information regarding research practice, specifically, feasibility of research by identifying barriers and facilitating factors. Therefore, each data set provided "different types of information" (Creswell, 2014, p. 219) and was analyzed separately using the specific methodology described below. Validity was established for this study by adhering to validity procedures for both quantitative and qualitative data analysis. Additional details are provided below in the description of the data analysis procedures.

Creswell (2014) describes the convergent parallel mixed-methods design as one of the types of mixed-methods design. The term '*modified*' is used here to describe the study design because the study does not meet all the expectations of a true convergent parallel mixed-methods

design. A mixed-methods design assumes that all constructs measured quantitatively should have corresponding qualitative analysis. The open-ended questions, in this study, only addressed research practice, whereas all three domains were addressed in the quantitative analysis. Secondly, although the open-ended questions were analyzed using established qualitative data analysis methods, these questions were directed specifically towards barrier and facilitating factors. Finally, follow-up with the participants was not integrated into the study methodology. These modifications to the data collection and data analysis can be a limitation to the study (Creswell, 2014).

The main benefit of using a convergent parallel mixed-methods design is the ability to draw on qualitative and quantitative data to strengthen the findings and get a more complete understanding of the overall research question. This approach also minimizes the frequency of limitations inherent to a purely quantitative or purely qualitative approach (Creswell, 2014, p. 2018). One limitation of this approach is "the need for extensive data collection, the time sensitive nature of analyzing both qualitative and quantitative data, and the requirement for the researcher to be familiar with both the quantitative and qualitative forms of research" (Creswell, 2014, p. 219). The combination of using both quantitative and qualitative data together can better inform a study's findings and the study's ability to interpret the meaning of the data to answer the study hypotheses than either method alone (Deborah DeLuca, 2020, Class notes)

Since this study made no attempt to control or manipulate the predictor variables, it was considered a non-experimental design (Kumar, 2011, p. 391). This non-experimental study was **descriptive** because the overarching research question aimed "to describe" research knowledge, attitude, and practice (Kumar, 2011, p. 383). In addition to describing research knowledge, attitude, and practice, this study also described the personal and professional characteristics of

the sample. According to the definitions put forth by Kumar (2011, p. 385), the study can also be considered exploratory because the study explored an area where little is known. The exploratory design was especially true for the open-ended questions that explored barrier/facilitatory factors to research engagement. Since data collection occurred at one point in time, it was also considered a cross-sectional design. Finally, this study was correlational because it also "investigate[d] whether or not there is a relationship between two or more variables (Kumar, 2011, p. 382).

An increase in available empirical evidence is needed to address the problem of limited validated evidence-based practice in The Masgutova Method®. To create a more robust empirical evidence base, there first needs to be an understanding of research knowledge, attitude, and practices of the stakeholders best positioned to conduct research in The Masgutova Method®. Research knowledge, attitude, and practice have been explored in similar professional groups using a similar methodology (Morgenshtern et al., 2011; Early, 2013; Ried et al., 2008; Harding et al., 2010; Short et al., 2009; Schmidt & Kirby, 2016). Therefore, a modified concurrent mixed-methods design was chosen to examine this topic as the most appropriate method. One of the benefits of integrating qualitative and quantitative data is that the product of quantitative and qualitative data components is greater than if either data set was analyzed singularly (Fetters & Freshwater, 2015; Åkerblad et al., 2020).

### ***Sample Selection***

This study utilized a purposeful sample of MNRI® Core Specialists. This sample was determined as "likely to have the required information and are willing to share it" (Kumar, 2011, p. 389). In addition to being a primary stakeholder in The Masgutova Method®, MNRI® Core Specialists hold the highest certification in the method. Furthermore, they are frequently from

professional backgrounds that value research and incorporate research training, to varying degrees, in their educational training. Therefore, they are potentially well-positioned to conduct research in this method.

The sample frame included all MNRI® Core specialists certified through the Svetlana Masgutova Educational Institute® (SMEI) in Orlando, Florida, and the Svetlana Masgutova International Institute in Warsaw, Poland. Together these two organizations have access to the entire sampling frame as the only two institutions established to certify MNRI® Core Specialists.

### ***Inclusion/Exclusion Criteria***

Inclusion criteria are parameters that determine whether prospective study participants are included in a study (Portney & Watkins, 2000). To be included in this study, all participants needed to be an MNRI® Core Specialist, be proficient in reading and writing English, have access to a web-based emailed questionnaire, and be 18 years of age or older. Characteristics that disqualified prospective participants from this study were anything that fell outside the parameters outlined in the inclusion criteria. Specifically, the exclusion criteria for this study included anyone who did not hold the MNRI® Core Specialist Certification, anyone not proficient with reading and writing English, anyone without access to the web-based, emailed questionnaire, and anyone 17 years old or younger.

**Table 5***Study Inclusion/Exclusion Criteria*

Inclusion Criteria	Exclusion Criteria
Completion of the MNRI® Internship Program- Certified MNRI® Core Specialists	Has not completed the MNRI® Internship Program
Proficient in reading/writing English	Not proficient in reading/writing English
Access to a web-based emailed questionnaire	No access to a web-based emailed questionnaire
18 years of age or older	17 years old or younger

***Sample Size***

A Priori G\*Power analysis was performed for each sub-research question to determine the sample size for this study. In this analysis, "the necessary sample size is computed as function of user-specified values for the required significance level  $\alpha$ , the desired statistic power  $1-\beta$ , and the to be detected population effect size" (Faul et al., 2009, p. 1149). The user-specified values used in this study was  $\alpha = 0.05$ , P-value of = 0.80/0.88, and a medium effect size ( $w = 0.3$ ). The A Priori G\*Power analysis requiring the highest number of study participants was  $n = 102$ . A fifteen percent attrition rate was added which yielded the desired sample size of  $n = 118$ .

***Participant Recruitment***

Eligible study participants were recruited through the Svetlana Masgutova Educational Institute in Orlando, Florida, and the Svetlana Masgutova International Institute in Warsaw, Poland (**Appendix B**).

Following approval of the Seton Hall University Institutional Review Board (**Appendix A**), I emailed the study solicitation letter to both organizations. Both organizations were then responsible for emailing the recruitment letter to all certified MNRI® Core Specialists. As part of

the contingency plan, the study was also posted to a private Facebook® group named "Worldwide MNRI® Core Specialists" with the permission of the group's administrator, Wil Van Kessel (**Appendix B**).

If interested, study participants utilized the weblink to the study questionnaire on Survey Monkey®. Informed consent was achieved first by the study participants' engagement with the study questionnaire. Then, eligibility was confirmed by answering three inclusion criteria questions at the beginning of the questionnaire.

The recruitment period was a total of 4 weeks in duration. When the study opened, the number of certified MNRI® Core Specialists was estimated to be 151. For this study, 150 participants responded to the study questionnaire. Of the 150 responses, 17 were excluded for not meeting the inclusion criteria. Twelve participants were not MNRI® Core Specialists, and five indicated they were not proficient in reading and writing English. An additional 31 participants did not complete the survey questionnaire. Only fully completed surveys were included in the data analysis. At the conclusion of the study, 102 individuals completed the survey questionnaire in its entirety. The final sample size for this study was  $n = 102$ .

### ***Data Collection***

Data was collected for both data sets simultaneously with the same study participants using a web-based study survey using the SurveyMonkey® platform. The survey consisted of 5 parts: (1) eligibility, (3) research instrumentation (*Research Knowledge Assessment*®, *Attitudes Toward Research Scale*®, *Wessex Research Network Spider*®), (4) Research Practice, (5) Research Attitude, and (6) Personal and professional demographics. Please see **Appendix C** for instrument permissions.

The Svetlana Masgutova Educational Institute and The Dr. Svetlana Masgutova

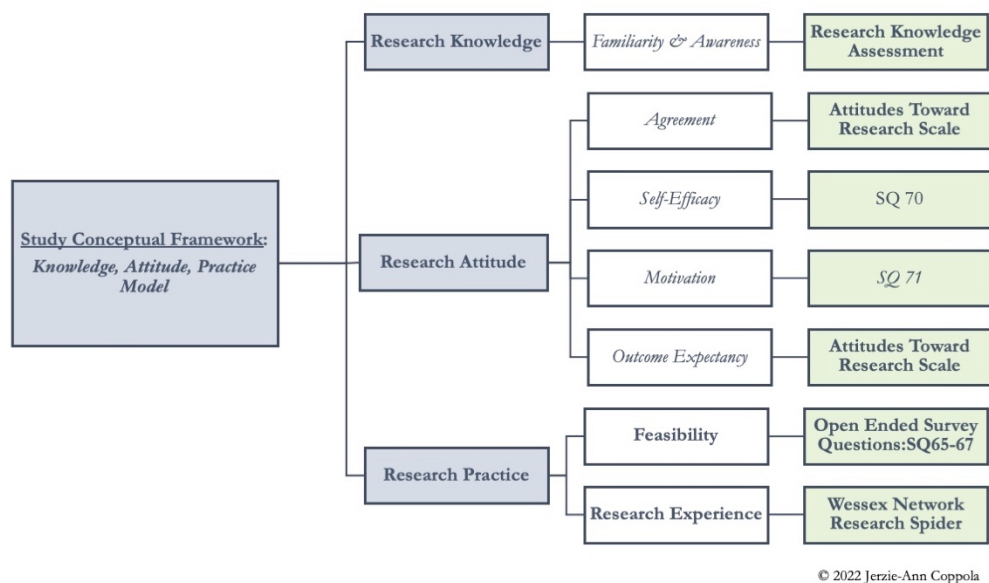
International Institute emailed the recruitment email to all MNRI® Core Specialists. Reminder emails followed 1-week, 2 weeks, and 3-weeks following the initial contact. During weeks 3 & 4, the IRB-approved contingency plan was initiated. With the permission of the Facebook® group's administrator, two IRB-approved Facebook posts were made on the MNRI® Worldwide Core Specialists page exactly one week apart.

### ***Instrumentation***

Data collection occurred in alignment with the domain and attributes of the KAPM model, with emphasis placed on the domain level. **Figure 6** outlines the measurement taken for both the domain and attribute level of the KAPM.

**Figure 6**

*Conceptual Study: Measurement of Domains & Attributes*



*Note.* Emphasis was placed on variables and measurements in bold.

Three valid and reliable research tools were included in the study survey. These included The *Research Knowledge Assessment*© (Lambie et al., 2014ab), The *Attitude Toward Research Scale*© (Papanastasiou, 2005; Papanastasiou & Schumacker, 2014), and The *Wessex Research Network Spider*© (Smith et al., 2002). Permissions to use each instrument is located in **Appendix C**.

#### **Research Knowledge Assessment©.**

The *Research Knowledge Assessment*© (Lambie et al., 2014ab) is a 50-item multiple-choice assessment of research methodology. The assessment was originally designed to assess knowledge of research methodology along eight subscales among doctoral education students. The eight subscales include (1) literature reviews, (2) ethics in educational research, (3) research designs, (4) sampling, (5) data collection methodologies, (6) data analysis procedures, (7) data reporting, & (8) scholarly writing practices (Lambie et al., 2014b, p. 145). Content validity was established using a Delphi panel of 10 experts in doctoral-level education and faculty of research methodology. Construct validity for this tool was based on an extensive research methodology literature review. Finally, reliability was established at  $\alpha = 0.850$  (Lambie et al., 2014b, p. 140). This tool has been used in the literature with social work students, Ph.D. Education Students, and other university students (Lambie et al., 2014b; Secret et al., 2017; Poh & Kanesan Abdullah, 2019).

#### **Attitudes Toward Research Scale©.**

The *Attitude Toward Research Scale*© (Papanastasiou, 2005; Papanastasiou & Schumacker, 2014) is a self-report measure using a 7-point Likert scale, intervals from strongly disagree to strongly agree. The *original* version of this tool was reduced from 32 to 30 items. "The *Attitudes Toward Research Scale* (ATRS) aims at measuring students' views in relation to

the subject area of research, by focusing on their overall attitudes, their perceptions of the usefulness of research to their profession and to everyday life, as well as their positive and negative feelings towards the subject" (Papanastasiou & Schumacker, 2014, p. 3). The initial factor analysis on the 32-item questionnaire yielded a Cronbach alpha = 0.947 across five factors. For this study, only the Attitude Total Score was analyzed.

In 2014, Papanastasiou & Schumacker conducted a Rasch Analysis to establish the psychometric properties of the tool, which prompted the reduction of items from 32 to 30. During this analysis, Person Reliability was .94. Item Reliability was 1.00 (Papanastasiou & Schumacker, 2014, p. 7). For Person and Item reliability, values  $>.80$  are generally acceptable (Fox & Jones, 1998; as cited in Papanastasiou & Schumacker, 2014, p. 7). This tool has been used to explore attitudes toward research in clinical and non-clinical postgraduate medical students, graduate students, psychology students, and social work students (van der Westhuizen, 2015; Howard & Michael, 2019; Hardway & Stroud, 2014; Negrea et al., 2018, Early, 2013; Sawant et al., 2017; Kakupa & Xue, 2019).

### **Wessex Research Network Spider©.**

The *Wessex Research Network Spider©* (WReN), also referred to in the literature as the *Research Spider©* (Smith et al., 2002), is a self-rating of research experience from 'no experience' to 'very experienced' using a 5-point Likert scale for ten discrete research-related activities (Smith et al., 2002). This assessment assesses research experience among large interdisciplinary health care professional groups to inform educational program design.

Consultation with researchers and academics established the face validity of the WReN. The original validation study used a Spearman's rank correlation  $r = -0.73$  to correlate the tool

with actual research experience, such as publications/grants, using a Spearman's rank correlation. Test-Retest Reliability was determined to be excellent at 0.95 (Smith et al., 2002).

Puerta et al. (2019) identified the use of the WReN in the literature as either a stand-alone measurement or to be used concurrently with additional assessments or qualitative data collection. These included: (1) assessing “gaps in professionals’ research experience/skills,” and (2) utilizing the instrument as a pre/post assessment following intervention (i.e., research capacity building program, research education, or research project (p. 3). This tool has been used in the literature to examine research capacity-building programs, determine a baseline research capacity in healthcare professionals, and evaluate research experience in interdisciplinary groups (Ried et al., 2008; Schmidt et al., 2019; Dennett et al., 2020; Taylor et al., 2019; Stephens et al., 2009; Harding et al., 2010; Pighills et al., 2013; Nonoyama et al., 2015; Leung et al., 2012)

### **Data Analysis Plan**

The data analysis plan presented here describes both the quantitative and qualitative data analysis. The purpose of this analysis plan is to answer the *overarching research question*.

The *overarching research question* for this study is:

**What is the research knowledge, attitude, and practice of MRNI® Core Specialists?**

This research question is important because it begins to develop a baseline understanding of research knowledge, attitude, and practice in MRNI® Core Specialists that can be used as a springboard to develop programmatic and educational programming to increase research engagement in this population. Sub-research questions and their subsequent data analysis are provided here to support the overarching research question. The data analysis plan concludes with an integration of the separate qualitative and quantitative analyses. The 'integration' of each

analysis was used to further understand MNRI® Core Specialists' research knowledge, attitude, and practice.

### ***Quantitative Data Analysis***

For the quantitative data analysis, the data was uploaded into SPSS version 28.0 for Windows. Participants who did not respond to all of the survey were removed from further descriptive and inferential testing. The scales for Research knowledge, Research Attitude, and Research Practice were calculated by following the scoring instructions on each instrument. Potential outliers were identified through the use of *z*-scores and box plot analysis. Participants with *z*-scores exceeding  $\pm 3.29$  standard deviations from the mean corresponded to outliers (Tabachnick & Fidell, 2013). Statistical significance for all inferential analyses was evaluated at the generally accepted level,  $\alpha = .05$  (Cohen, 1988).

### **Detailed Analysis.**

**RQ1:** What are the sociodemographic and professional characteristics of MNRI® Core Specialists?

**RQ2:** What is the Research Knowledge of MNRI® Core Specialists, as measured by the Research Knowledge Assessment?

**RQ3:** What is the Research Attitude of MNRI® Core Specialists as measured by the Attitudes Toward Research Questionnaire?

**RQ4:** What is the Research Self-Efficacy of MNRI® Core Specialists?

**RQ5:** What is the Research Motivation of MNRI® Core Specialists?

**RQ6:** What is the Research Practice of MNRI® Core® Specialists, as measured by the Wessex Network Research Spider?

To address RQ1-6, an exploratory data analysis was conducted. Exploratory data analysis examines the descriptive statistics for the variables of interest (Howell, 2013). Frequencies and percentages were calculated for the nominal and ordinal-level variables. Means and standard deviations were calculated for the interval-level variables. The mean scores on each survey were compared to the findings established in previous research. **Table 6** presents the variables and level of measurement for RQ1-4.

**Table 6**

*Variables and Level of Measurement for RQ1-RQ6*

Variable	Level of measurement	Calculation	Categories or Range of Scores
RQ1			
Gender	Nominal	-	3
Age	Interval	-	6
Ethnicity	Nominal	-	8
Professional Discipline	Nominal	-	10
Country of Practice	Nominal	-	2+
Highest Educational Degree	Ordinal	-	6
Practice Setting	Nominal	-	6
Specialist Certification	Nominal	-	11
Years of Practice	Interval	-	0-100
Years as MNRI® Core specialist	Interval	-	0-100
Level of Research Experience	Ordinal	-	4
RQ2			
Research Knowledge	Interval	Objective measurement consisting of 50 multiple choice items (correct/incorrect responses)	0-100 (percentage)
RQ3			
Research Attitude	Interval	Average of 30 Likert-type items	1.00-7.00
RQ4			
Research Self Efficacy	Ordinal	1 Likert-type item	1.00-5.00
RQ5			
Research Motivation	Ordinal	1 Likert-type item	1.00-5.00
RQ6			
Research Practice	Interval	Average of 10 Likert-type items	1.00-5.00

Cronbach's alpha tests of reliability and internal consistency were calculated for the *Attitude Toward Research Scale*© and *Wessex Network Research Spider*©. The Cronbach's alpha represents the average association between each pair of items and the number of items in a scale (Brace et al., 2012). The alpha values were interpreted using the guidelines suggested by George and Mallery (2016) where  $\alpha > .9$  Excellent,  $\alpha > .8$  Good,  $\alpha > .7$  Acceptable,  $\alpha > .6$  Questionable,  $\alpha > .5$  Poor, and  $\alpha < .5$  Unacceptable.

RQ7-9 uses inferential statistics to explore the relationship between personal and professional demographics and research knowledge, research attitude, and research practice. RQ7 explores the relationships between MNRI® Core Specialists' educational degree and research knowledge, attitude, and practice.

**RQ7:** Is there a relationship between Educational Degree, Research Knowledge, Research Attitude, and Research Practice? (ED-RK, ED-RA, ED-RP)

**RQ7a:** Is there a relationship between Educational Degree and Research Knowledge?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Knowledge.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Knowledge.

**RQ7b:** Is there a relationship between Educational Degree and Research Attitude?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Attitude.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Attitude.

**RQ7c:** Is there a relationship between Educational Degree and Research Practice?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Practice.

**H<sub>a</sub>** : There is a relationship between Educational Degree and Research Practice.

To address RQ7, three Spearman correlations were conducted to examine the relationship between Educational Degree and Research Knowledge, Research Attitude, and Research Practice. A Spearman correlation is appropriate when testing the association between two ordinal and interval-level variables (Pagano, 2009). Educational degree was an ordinal response on the demographic questionnaire. Research Knowledge, Research Attitude, and Research Practice were all interval measurements.

Due to the non-parametric nature of a Spearman correlation, there were no strict assumptions to verify prior to analysis. Spearman correlation coefficients ( $r_s$ ) can range from 0 (no relationship) to +1 (perfect positive linear relationship) or -1 (perfect inverse linear relationship). Cohen's standard (Cohen, 1988) was applied to interpret the coefficient strength, where coefficients between .10 and .29 represent a small association; coefficients between .30 and .49 represent a medium association; and coefficients above .50 represent a large association or relationship. Normality was assumed for this analysis.

RQ8 explores the relationship between years of professional experience and research knowledge, research attitude, and research practice.

**RQ8:** Is there a relationship between Years of Professional Experience and Research Knowledge, Research Attitude, and Research Practice? (YOE-RK, YOE-RA, YOE-RP)

**RQ8a:** Is there a relationship between Years of Professional Experience and Research Knowledge?

**H<sub>0</sub>** : There is no relationship between Years of Professional Experience and Research Knowledge.

$H_a$ : There is a relationship between Years of Professional Experience and Research Knowledge.

**RQ8b:** Is there a relationship between Years of Professional Experience and Research Attitude?

$H_0$ : There is no relationship between Years of Professional Experience and Research Attitude.

$H_a$ : There is a relationship between Years of Professional Experience and Research Attitude.

**RQ8c:** Is there a relationship between Years of Professional Experience and Research Practice?

$H_0$ : There is no relationship between Years of Professional Experience and Research Practice.

$H_a$ : There is a relationship between Years of Professional Experience and Research Practice.

To address RQ8, three Pearson correlations were planned to examine the relationship between Years of Professional Experience and Research Knowledge, Research Attitude, and Research Practice. A Pearson correlation is appropriate when testing the association between two interval-level variables (Pagano, 2009). Years of professional experience, Research Knowledge, Research Attitude, and Research Practice were all interval-level variables.

Prior to analysis on the Pearson correlation, the assumptions of linearity and normality were tested. Linearity was tested with a scatterplot between the pairs of relationships. Normality was tested with a Kolmogorov-Smirnov test on the four variables of interest. Non-significance ( $p$

> .05) on the Kolmogorov-Smirnov test indicated that the assumption of normality was met. Due to the assumptions of normality and linearity not being supported during data analysis (see Chapter 4), a series of Spearman correlations were conducted as the non-parametric alternative to the originally proposed Pearson correlations. Spearman correlation coefficients ( $r_s$ ) can range from 0 (no relationship) to +1 (perfect positive linear relationship) or -1 (perfect inverse linear relationship). Cohen's standard (Cohen, 1988) was applied to interpret the coefficient strength, where coefficients between .10 and .29 represent a small association; coefficients between .30 and .49 represent a medium association; and coefficients above .50 represent a large association or relationship.

**RQ9:** Is there a relationship between each domain pairing? (RK-RA, RK-RE, RA-RP)

**RQ9a:** Is there a relationship between Research Knowledge and Research Attitude?

$H_0$ : There is no relationship between Research Knowledge and Research Attitude.

$H_a$ : There is a relationship between Research Knowledge and Research Attitude.

**RQ9b:** Is there relationship between Research Knowledge and Research Practice?

$H_0$ : There is no relationship between Research Knowledge and Research Practice.

$H_a$ : There is a relationship between Research Knowledge and Research Practice.

**RQ9c:** Is there a relationship between Research Attitude and Research Practice?

$H_0$ : There is no relationship between Research Attitude and Research Practice.

$H_a$ : There is a relationship between Research Attitude and Research Practice.

To address RQ9, three Pearson correlations were planned to examine the relationship between Research Knowledge, Research Attitude, and Research Practice. Research Knowledge, Research Attitude, and Research Practice will all be interval-level variables.

Prior to analysis on the Pearson correlation, the assumptions of linearity and normality were tested. Linearity was tested with a scatterplot between the pairs of relationships. Normality was already tested in a previous research question with Kolmogorov-Smirnov tests.

Due to the assumptions of normality not being supported during data analysis (see Chapter 4), a series of Spearman correlations were conducted as the non-parametric alternative to the originally proposed Pearson correlations. Spearman correlation coefficients ( $r_s$ ) can range from 0 (no relationship) to +1 (perfect positive linear relationship) or -1 (perfect inverse linear relationship). Cohen's standard (Cohen, 1988) will be applied to interpret the coefficient strength, where coefficients between .10 and .29 represent a small association; coefficients between .30 and .49 represent a medium association; and coefficients above .50 represent a large association or relationship.

**Table 7** presents the variables and level of measurement for RQ7-9.

**Table 7***Variables and Level of Measurement for RQ7-RQ9*

Variable	Level of measurement	Calculation	Categories or Range of Scores
RQ7			
Highest Educational Degree	Ordinal	-	6
Research Knowledge	Interval	Objective measurement consisting of 50 multiple choice items (correct/incorrect responses)	0-100 (percentage)
Attitude	Interval	Average of 30 Likert-type items	1.00-7.00
Research Practice	Interval	Average of 10 Likert-type items	1.00-5.00
RQ8			
Years of Professional Experience	Interval	-	0-100
Research Knowledge	Interval	Objective measurement consisting of 50 multiple choice items (correct/incorrect responses)	0-100 (percentage)
Attitude	Interval	Average of 30 Likert-type items	1.00-7.00
Research Practice	Interval	Average of 10 Likert-type items	1.00-5.00
RQ9			
Research Knowledge	Interval	Objective measurement consisting of 50 multiple choice items (correct/incorrect responses)	0-100 (percentage)
Attitude	Interval	Average of 30 Likert-type items	1.00-7.00
Research Practice	Interval	Average of 10 Likert-type items	1.00-5.00

**Assessing Validity & Reliability.**

This study included three valid and reliable research tools. The *Research Knowledge Assessment*© (Lambie et al., 2014a), *The Attitudes Toward Research Scale*© (Papanastasiou, 2005; Papanastasiou & Schumacker, 2014), and the *Wessex Research Network Spider/Research Spider*© (Smith et al., 2002). See the above *Instrumentation* section for detailed information regarding the validity and reliability of each research tool. Internal consistency was calculated for each of the three instruments used in this study. "Internal consistency describes the extent to which all the items in a test measure the same concept or construct, and hence it is connected to the inter-relatedness of the items within the test" (Tavakol & Dennick, 2011, p. 53). The alpha

values were interpreted using the guidelines suggested by George and Mallery (2016) where  $\alpha > .9$  Excellent,  $\alpha > .8$  Good,  $\alpha > .7$  Acceptable,  $\alpha > .6$  Questionable,  $\alpha > .5$  Poor, and  $\alpha < .5$  Unacceptable.

### ***Qualitative Data Analysis- Modified***

As part of the modified concurrent embedded mixed-methods study, three open-ended questions were included in the survey questionnaire to address RQ10. The three open-ended questions corresponded to SQ63-65. These survey questions aimed to provide insight into the feasibility of research in this method by identifying perceived barriers and facilitators to research and contextualizing research practice in The Masgutova Method®.

The last research question explores feasibility of conducting research in The Masgutova Method®. Feasibility includes both barrier and facilitating factors to research.

**RQ10:** What are the barriers and facilitating factors to conducting research in The Masgutova Method®, as identified by MNRI® Core Specialists?

**Survey Question 63:** In your opinion, what are the barriers to conducting research in The Masgutova Method®?

**Survey Question 64:** In your opinion, what do you believe is necessary to be a successful researcher of The Masgutova Method®?

**Survey Question 65:** Is there anything else you would like to add regarding research in The Masgutova Method®?

Qualitative data analysis procedures informed the analysis of RQ10. Formal analysis of the qualitative data began immediately following the data collection phase of this study. **Table 8** outlines the data analysis process for the open-ended questions.

**Table 8***Qualitative Analysis Plan*

Step	Description
Step 1	Organize and prepare data for analysis
Step 2	Read and familiarize yourself with all the data
Step 3	First cycle coding- Initial Coding (Open-Coding)
Step 4	Second cycle coding- conceptual coding
Step 5	Third cycle coding- axial coding
Step 6	Describe preliminary themes for future analysis
Step 7	Confirm analysis through independent data review
Step 8	Visually represent the data
Step 9	Integration of Quantitative and Qualitative Analysis

*Note.* The qualitative analysis plan included eight steps adapted from (Creswell, 2014) and (Saldaña, 2014). Adapted from "Research Design Qualitative, Quantitative, and Mixed Methods Approaches," by J. W. Creswell. Copyright 2014 Sage Publications, Inc. Adapted from "The Coding Manual for Qualitative Researchers," by J. Saldaña. Copyright 2016 Sage Publications, Ltd.

### **Overview of the Overall Organizational Process.**

The First Cycle Open Coding used the comment balloons in Microsoft® Word for Mac v. 16.55. To prepare for Second Cycle-Conceptual Coding, I exported all comments and their associated datum into separate Microsoft® Excel for Mac v 16.56 spreadsheets using the DocTools Extract Data in Microsoft® Word.

Next, the three Microsoft® Excel Spreadsheets were color-coded. For example, SQ63 in red, SQ64 green, and SQ65 blue. Then the three documents were merged into a single Microsoft® Excel spreadsheet while maintaining the designated color scheme. Finally, I

organized the spreadsheet according to emerging categories and subcategories using the sorting function. Frequency counts of each code provided an additional visual of the impact of each code.

**Organize and prepare data for analysis.** Before coding, participant responses from SQ63-65 were exported from SurveyMonkey® and imported into Microsoft® Word for Mac v. 16.55. I created a separate document for each SQ. Formatting for each Microsoft® Word document included:

- Inserting page and line numbers
- Using a two-inch left-hand margin to accommodate analytic memos
- Setting the line spacing to 6 to ensure multiple comment balloons would not overlap

**Read and familiarize yourself with all the data.** I familiarized myself with the data by reading and re-reading the passages before coding.

**First cycle coding- Initial Coding (Open Coding).** I went "through each line of text and assign[ed] codes" (Creswell, 2014, p. 195). Codes are "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2016, p. 4). First Cycle codes were applied to the data using the comment function in Microsoft® Word.

Although the supplementary literature identified some potential barrier and facilitator factors, developed codes for this study were based only on "emerging information collected from participants" (Creswell, 2014, p. 199). Therefore, the origin of all the codes was *inductive*, meaning they were identified during the coding process (Saldaña, 2016). These emergent codes

were primarily descriptive. Since coding occurred in three cycles, the proposed codes during the First Cycle were "tentative and provisional" (Saldaña, 2016, p. 115).

**Second Cycle Coding- Concept Coding.** I completed the Second Cycle Coding in Microsoft® Excel. In this cycle, First Cycle-Initial Codes were re-evaluated conceptually. The study's conceptual framework and my positionality informed the emerging categories and subcategories during this coding cycle. "Positionality refers to the stance or positioning of the researcher in relation to the social and political context of the study—the community, the organization or the participant group. The position adopted by a researcher affects every phase of the research process..." (Rowe, 2014, p. 2 of Chapter PDF). Specifically, the study's conceptual framework, my professional background, my research training, and scholarly literature informed emerging categories and subcategories. **Table 9** summarizes the concepts informing Second Cycle Coding.

**Table 9**

*Concepts Informing Second Cycle Coding*

Concept	Description
Study Conceptual Framework	The study's conceptual framework Research Knowledge, Attitude, and Practice, informed the concept of research capacity.
Professional background	The PI's training as an Occupational Therapist trained in Sensory Integration Theory and Intervention informed the concept of Fidelity in The Masgutova Method®.
Research Training & Educational Programming	The PI's didactic training in research methods informed the concept of study methodology.
Scholarly Literature	The literature review for the research proposal of this study informed the concept of recognition in the medical community and the range of evidence.

**Third cycle coding- axial coding.** In the third coding cycle, I "strategically reassembled data that were 'split' or 'fractured' during the Initial coding process" (Saldaña, 2016, p. 244). Next, I sorted the categories into five broad axes. "The 'axis' of axial coding is a category" (Saldaña, 2016, p. 244). Categories are related codes or patterns of codes.

**Describe preliminary themes for future analysis.** The interpretation of preliminarily themes allowed me to begin to capture the essence of the data analysis. Lincoln & Guba (1985, cited in Creswell, 2014, p. 200) summarized this stage as describing, "What were the lessons learned?" Two preliminary themes are discussed briefly in this report. Other components are not reported here but will continue to be analyzed.

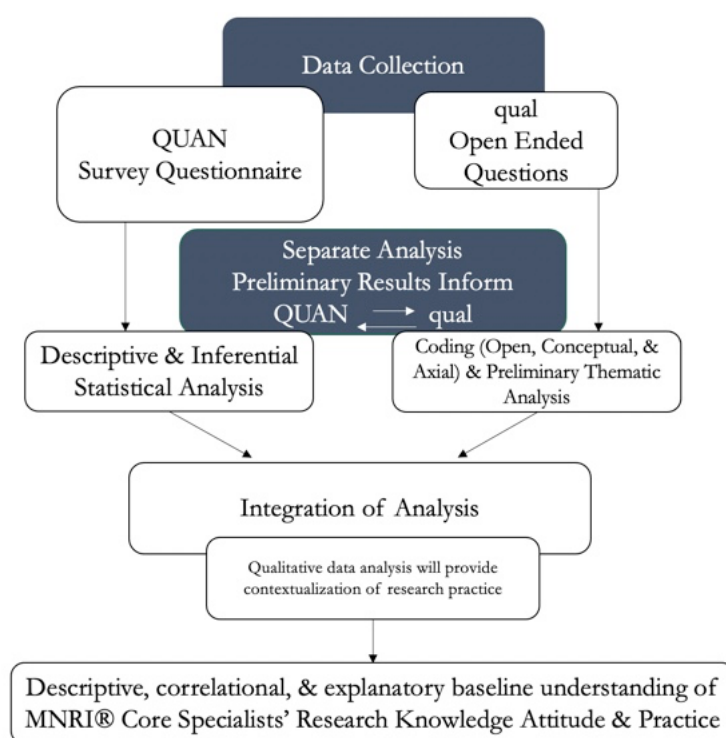
This research study aimed to develop a baseline understanding of research knowledge, attitude, and practice that can be translated practically and applied programmatically to support future scholarship. Data analysis of the categories and subcategories had the most immediate practical application to practice. Therefore, most of the data analysis reported here focuses on these two levels of analysis: categories and subcategories.

**Confirm analysis through independent data review.** A qualitative specialist conducted an independent review of the data to support the trustworthiness of the data analysis. I created a codebook as codes emerged from the data for consideration by the qualitative specialists. The codebook consisted of a list of codes, a brief definition of each code, and an example of a quote for each code (Creswell, 2014, p. 199). As a result of this independent review, the reviewer found consistency in the coding process as discussed and described. The coding process was as intended and repeated consistently throughout the entire analysis.

**Visually represent the data.** The interpretation of the analysis was represented by using both a narrative passage and visuals to "convey findings of the analysis" (Creswell, 2014, p. 200). To illustrate the data visually, I used a concept map and hierarchy chart. A concept map allowed me to show the relationship between the categories and subcategories, while the hierarchy chart illustrated the weight of the categories and subcategories. I generated the concept map using XMind for IOS v. 3.1.3 and the hierarchy chart using Nvivo 1.4.1. Importantly, Nvivo 1.4.1 was only used to visualize the data after analysis was completed in Microsoft® Word and Microsoft® Excel as described above.

### **Integration of Qualitative and Quantitative Analysis**

The quantitative and qualitative analysis integration immediately followed each separate, independent analysis. **Figure 7** provides a schematic of the integration process for this study.

**Figure 7***Integration Process*

*Note.* Integration of the qualitative and quantitative data followed the independent analysis of each data set. In this study, the qualitative data contextualized the research practice of MNRI® Core Specialists by highlighting barriers and facilitating factors. Schematic adapted from "Integrative Strategies in Mixed Methods Research," by L. Åkerblad, R. Seppänen-Järvelä, & K. Haapakoski, 2020, *Journal of Mixed Methods Research*, 15(2), p. 163. (<https://journals.sagepub.com/doi/pdf/10.1177/1558689820957125>).

***Rigor of the qualitative analysis.***

Rigor in qualitative analysis is comparable to validity and reliability in quantitative research. Therefore, to demonstrate rigor in the qualitative analysis of this study, I took several

steps to ensure trustworthiness. These steps included measures to support consistency, neutrality, truth value, and applicability (Noble & Smith, 2015, p. 34; Lincoln & Guba, 1985).

Truth value, an alternative to validity, "recognizes that multiple realities exist; the researchers' outline personal experiences and viewpoints that may have resulted in methodological bias; [and] clearly and accurately presents participants' perspectives" (Noble & Smith, 2015, p. 34). Several strategies were employed in this study to address truth value. First, I reflected on my perspectives through analytical memos, developed a position statement, and used peer and dissertation committee debriefing (Noble & Smith, 2015) to uncover and explore biases and assumptions. Secondly, I ensured the "representativeness of the findings in relation to the phenomena" (Noble & Smith, 2015, p. 35). Representativeness was addressed by reviewing data multiple times to ensure accuracy of interpretation and by presenting verbatim quotes from participants in the research findings.

Consistency and neutrality are alternatives to reliability (Noble & Smith, 2015, 2015).

#### Consistency

relates to the 'trustworthiness' by which the methods have been undertaken and is dependent on the researcher maintaining a 'decision-trail'; i.e., the researcher's decisions are clear and transparent. Ultimately an independent researcher should be able to arrive at similar or comparable findings (Noble & Smith, 2015, p. 34).

I developed a codebook as the analysis progressed to ensure consistency during analysis. The codebook contained clearly articulated definitions of each code, subcategory, and category. Analysis was confirmed using *an independent review of the data*. A qualitative expert, and member of the dissertation committee, reviewed the data for consistency in the coding process and inter-rater reliability ensured the accuracy of data analysis. The reviewer confirmed that the

coding process was discussed and described clearly. The independent data review confirmed that I completed the analysis as intended. Finally, the qualitative expert checked the data analysis for consistency.

*Neutrality* is

achieved when truth value, consistency and applicability have been addressed.

Centres[sic] on acknowledging the complexity of prolonged engagement with participants and that the methods undertaken and findings are intrinsically linked to the researchers' philosophical position, experiences and perspectives. These should be accounted for and differentiated from participants' accounts (Noble & Smith, 2015, p. 34).

To support the neutrality of the study, I provided a positionality statement.

Finally, applicability is the qualitative alternative to generalizability. Applicability is defined as "consideration is given to whether findings can be applied to other contexts, settings or groups" (Noble & Smith, 2015, p. 34). The findings of this study apply only to the study sample. Therefore, consumers of the research will need to evaluate the value of the study to their application.

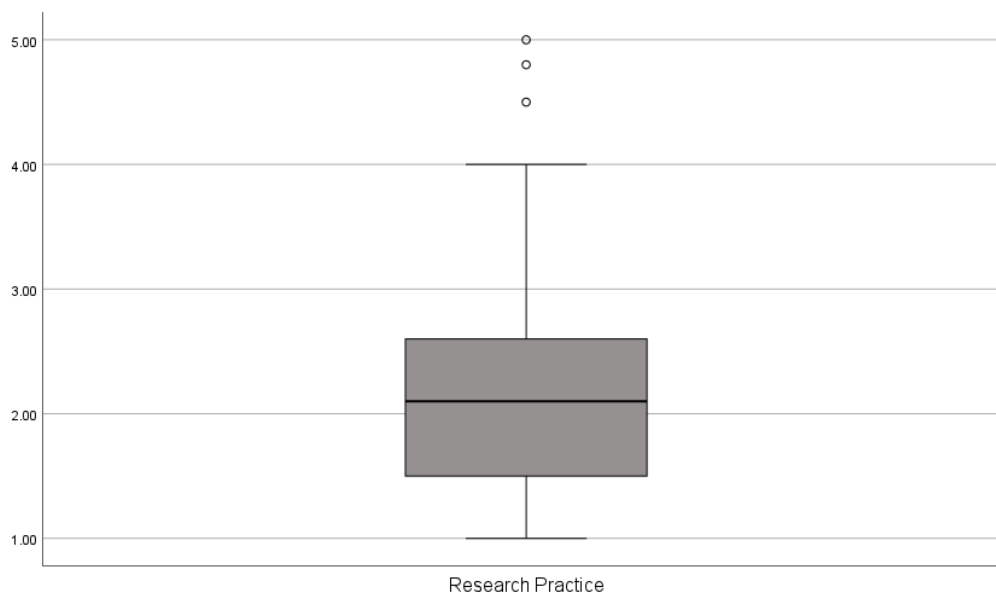
## Chapter IV: RESULTS

The purpose of this study was to establish a baseline understanding of MNRI® Core Specialists' Research Knowledge, Attitude, and Practice. I cleaned the data to account for non-responses and outliers. Exploratory data analysis, Spearman correlations, and Pearson correlations were planned to examine the research questions. Statistical significance was evaluated at the generally accepted level,  $\alpha = .05$ .

### Data Cleaning and Management

The initial sample consisted of 150 participants. A total of 17 participants were removed due to not meeting the inclusion criteria. In addition, 31 participants were removed for not responding to the complete survey. Composite scores were developed for Research Knowledge, Research Attitudes, and Research Practice. Research Knowledge was computed through an objective instrument containing 50 survey questions. Possible Research Knowledge scores ranged from 0 to 100. Research Attitude consisted of 30 Likert-scale items, ranging from 1 = strongly disagree to 7 = strongly agree. Eleven of the items on Research Attitude were negatively phrased and were reverse coded. The composite score for Research Attitude was computed through an average of the 30 survey items. Research Practice consisted of 10 survey items ranging from 1 = no experience to 5 = very experienced. The composite score for Research Practice was computed through an average of the 10 survey items.

The scores on the survey were standardized using suggestions by Tabachnick & Fidell (2013), in which z-scores exceeding  $\pm 3.29$  are outlying values. Using this criteria, one participant had an outlying score for Research Practice. However, this case was *not* identified as an outlier in the associated boxplot (see **Figure 8**). Therefore, no reductions were made to the spreadsheet for outliers. The final sample consisted of 102 participants.

**Figure 8***Box Plot of Research Practice Z-Scores*

*Note.* Visual examination of the associated Box Plot for Research Practice revealed no outliers.

## Quantitative Analysis

***RQ1: What are the sociodemographic and professional characteristics of MNRI®***

### ***Core Specialists?***

A majority of the sample consisted of females ( $n = 93, 91.2\%$ ). Age of participants widely varied, with most participants being 45-54 ( $n = 29, 28.4\%$ ) or 55-64 years ( $n = 32, 31.4\%$ ). A majority of the sample consisted of White or Caucasians ( $n = 80, 78.4\%$ ). Most participants had either a Bachelor's degree ( $n = 41, 40.2\%$ ) or a Master's degree ( $n = 51, 50.0\%$ ). Most participants had an occupational therapy background ( $n = 29, 28.4\%$ ), physical therapy background ( $n = 17, 16.7\%$ ), or were educators ( $n = 20, 19.6\%$ ). The sample consisted of 69 US-based practitioners and 33 non-US based practitioners. A majority of participants' primary practice setting was a private practice ( $n = 73, 71.6\%$ ). Participants had a variety of specialist certifications, with many having sensory integration training ( $n = 32, 31.4\%$ ), and

“other” specialist certification ( $n = 37$ , 36.3%), or no additional certifications ( $n = 29$ , 28.4%).

A majority of participants had 1-5 years of experience as an MNRI® Core Specialist ( $n = 52$ , 51.0%). There was a wide range of experience for years in current profession. Most participants described their level of research experiences as non-participatory ( $n = 68$ , 66.7%). **Tables 10-13** present the frequencies of the nominal-level variables.

**Table 10**

*Frequency Table for Nominal Variables Gender, Age, & Ethnicity*

Variable	<i>n</i>	%
Gender		
Male	4	3.9
Female	93	91.2
Prefer not to answer	5	4.9
Age		
25-34	5	4.9
35-44	22	21.6
45-54	29	28.4
55-64	32	31.4
65+	14	13.7
Ethnicity <sup>a</sup>		
White or Caucasian	80	78.4
Black or African American	2	2.0
Asian or Asian American	4	3.9
I prefer not to answer	13	12.7
Other	3	2.9
<i>Dutch</i>		
<i>European</i>		
<i>Women of Color</i>		

<sup>a</sup> Participants could provide multiple responses to ethnicity and specialist certification.

**Table 11**

*Frequency Table for Nominal Variables Highest Professional Degree, Professional Background, & US-Based or Non-US Based Practitioner*

Variable	<i>n</i>	%
Highest Professional Degree		
High school diploma/GED	1	1.0
Associate degree	3	2.9
Bachelor degree	41	40.2
Master degree	51	50.0
Clinical doctorate	2	2.0
PhD	4	3.9
Professional Background		
Occupational Therapy	29	28.4
Physical Therapy	17	16.7
Speech Language Pathology	9	8.8
Nurse	2	2.0
Educator	20	19.6
Psychologist	2	2.0
Massage Therapist	4	3.9
Other	19	18.6
US-Based or Non-US Based Practitioner		
United States	69	67.6
Non- US based Practitioner	33	32.4
Canada	3	2.9
Europe	2	2.0
Sweden	2	2.0
France	3	2.9
Hrvatska (Croatia)	1	1.0
Indonesia	1	1.0
Netherlands	4	3.9
Poland	2	2.0
Slovenia	1	1.0
Vietnam	1	1.0
Not Indicated	13	12.7

**Table 12**

*Frequency Table for Nominal Variables Levels of Research Experience, Primary Practice Setting, & Specialists Certification*

Variable	<i>n</i>	%
Level of Research Experience		
Category 1: Non-Participant	68	66.7
Category 2: Participant (Member of a research team)	23	22.5
Category 3: Clinical Researcher (Manage own research)	7	6.9
Category 4: Academic (Experienced researcher)	4	3.9
Primary Practice Setting		
School based	6	5.9
Private practice	73	71.6
Hospital based	5	4.9
Outpatient office	10	9.8
Early Intervention	1	1.0
Educational	1	1.0
Home based early intervention	1	1.0
Lecturer, assessment specialist, supervisor, director	1	1.0
Private practice, in client homes	1	1.0
Retired from School Based setting	1	1.0
Stay at home mom	1	1.0
Other	1	1.0
Specialist Certification <sup>a</sup>		
Hand specialists	4	3.9
Sensory Integration Training	32	31.4
Neurodevelopmental Treatment (NDT)	10	9.8
Prompt	2	2.0
Cranial Sacral Therapy	18	17.6
Tomatis®/Listening Therapies	15	14.7
Lymphoedema Management	2	2.0
Vestibular Rehabilitation	3	2.9
Myofunctional Therapy	2	2.0
Myofascial	9	8.8
Do not hold any additional certifications	29	28.4
Other	37	36.3

<sup>a</sup> Participants could provide multiple responses to ethnicity and specialist certification.

**Table 13**

*Frequency Table for Nominal Variables Years as an MNRI® Core Specialists & Years of Professional Experience*

Variable	<i>n</i>	%
Years as an MNRI® Core Specialist?		
Less than 1 year	5	4.9
1-5 years	52	51.0
6-10 years	27	26.5
11-15 years	13	12.7
16+ years	5	4.9
Years of Professional Experience		
1-5 years	6	5.9
6-10 years	13	12.7
11-15 years	8	7.8
16-20 years	18	17.6
21-25 years	20	19.6
26-30 years	18	17.6
31+ years	19	18.6

***RQ2: What is the Research Knowledge of MNRI® Core Specialists, as measured by the Research Knowledge Assessment?***

Research Knowledge scores ranged from 24.00 to 96.00, with  $M = 54.71$  and  $SD = 15.08$ . The mean indicates that the average Research Knowledge score was 54.71%. The Research Knowledge Scale met the acceptable threshold for internal consistency ( $\alpha = .82$ ). The alpha values were interpreted using the guidelines suggested by George and Mallery (2016) where  $\alpha > .9$  Excellent,  $\alpha > .8$  Good,  $\alpha > .7$  Acceptable,  $\alpha > .6$  Questionable,  $\alpha > .5$  Poor, and  $\alpha < .5$  Unacceptable. “Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the

items within the test (Tavakol & Dennick, 2011, p. 53). The summary statistics for Research Knowledge are presented in **Table 14**. **Figure 9** presents a histogram of the knowledge scores.

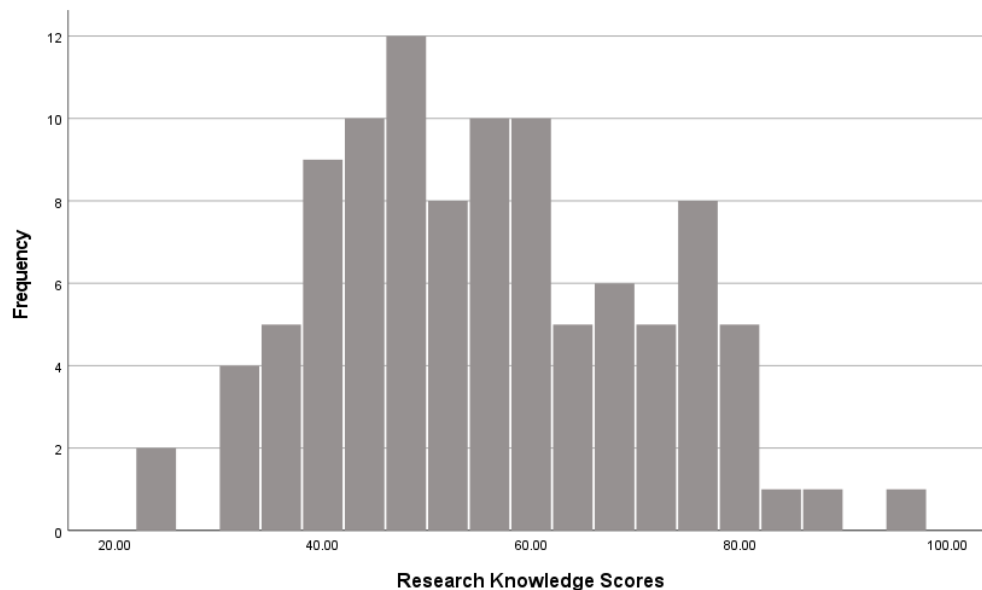
**Table 14**

*Summary Statistics Table for Research Knowledge*

Variable	<i>n</i>	Min	Max	<i>M</i>	<i>SD</i>	$\alpha$
Research Knowledge	102	24.00	96.00	54.71	15.08	.82

**Figure 9**

*Histogram for Research Knowledge Scores.*



**RQ3: What is the Research Attitude of MNRI® Core Specialists as measured by the Attitudes Toward Research Questionnaire?**

Research Attitude scores ranged from 2.73 to 6.50, with  $M = 4.64$  and  $SD = 0.74$ . The mean of 4.64 indicates that participants were agreeable on the items regarding Research Attitude. The Research Attitude scale also met the acceptable threshold for internal consistency ( $\alpha = .89$ ).

The summary statistics for Research Attitude are presented in **Table 15**. **Figure 10** presents a histogram of the Research Attitude scores.

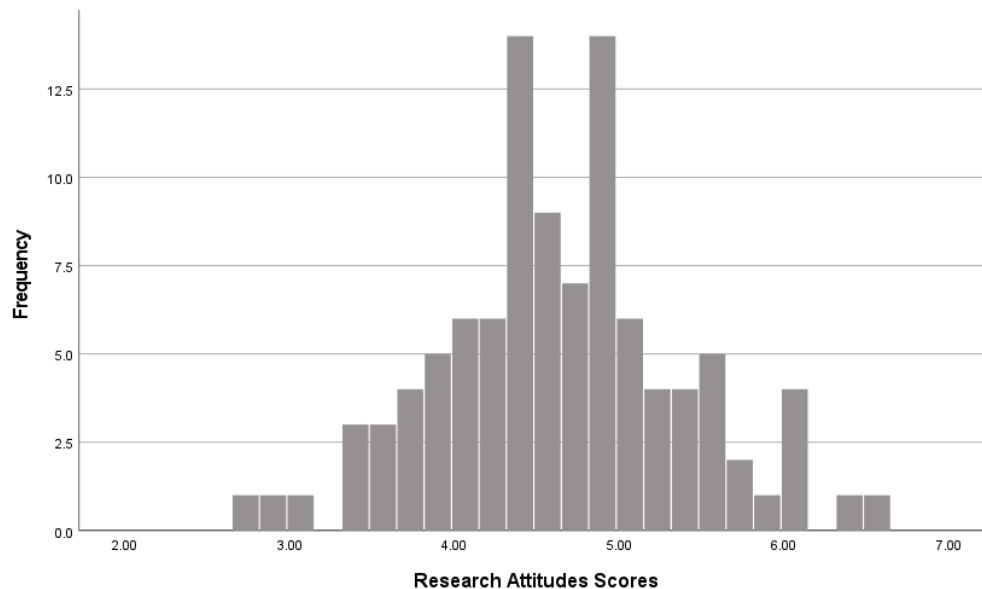
**Table 15**

*Summary Statistics Table for Research Attitudes*

Variable	<i>n</i>	Min	Max	<i>M</i>	<i>SD</i>	Number of items	$\alpha$
Research Attitudes	102	2.73	6.50	4.64	0.74	30	.89

**Figure 10**

*Histogram for Research Attitude.*



**RQ4: What is the Research Self-Efficacy of MNRI® Core Specialists?**

Most participants indicated that they were not at all confident ( $n = 31$ , 30.4%), not so confident ( $n = 29$ , 28.4%), or somewhat confident ( $n = 32$ , 31.4%) in their ability to conduct research. **Table 16** presents the frequencies for research self-efficacy.

**Table 16***Frequency Table for Research Self-Efficacy*

Variable	<i>n</i>	%
Overall, how confident are you in your ability to conduct research?		
Not at all confident	31	30.4
Not so confident	29	28.4
Somewhat confident	32	31.4
Very confident	8	7.8
Extremely confident	2	2.0

Research self-efficacy scores ranged from 1.00 to 5.00, with  $M = 3.78$  and  $SD = 1.03$ .

The mean of 3.78 indicates that participants in general were confident on the items regarding research self-efficacy. The summary statistics for research self-efficacy are presented in **Table**

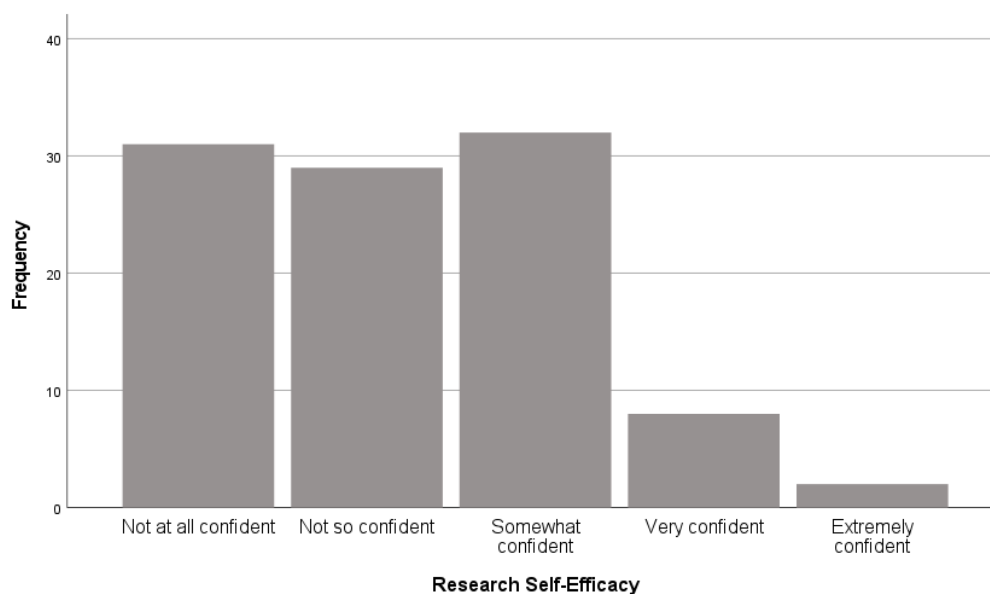
**17.** **Figure 11** presents a bar chart for research self-efficacy.

**Table 17***Summary Statistics Table for Research Self-Efficacy*

Variable	<i>n</i>	Min	Max	<i>M</i>	<i>SD</i>
Research Self-Efficacy	102	1.00	5.00	3.78	1.03

**Figure 11**

*Bar Chart for Research Self-Efficacy.*



**RQ5: What is the Research Motivation of MNRI® Core Specialists?**

Most participants indicated that they were not so motivated ( $n = 30$ , 29.4%) or somewhat motivated ( $n = 41$ , 40.2%) in their ability to conduct research. **Table 18** presents the frequencies for research motivation.

**Table 18**

*Frequency Table for Research Motivation*

Variable	<i>n</i>	%
Overall, how motivated are you to conduct research?		
Not at all motivated	14	13.7
Not so motivated	30	29.4
Somewhat motivated	41	40.2
Very motivated	12	11.8
Extremely motivated	5	4.9

Research motivation scores ranged from 1.00 to 5.00, with  $M = 3.35$  and  $SD = 1.02$ . The mean of 3.35 indicates that participants in general were neutral regarding their responses on research motivation. The summary statistics for research motivation are presented in **Table 19**.

**Figure 12** presents a bar chart for research motivation.

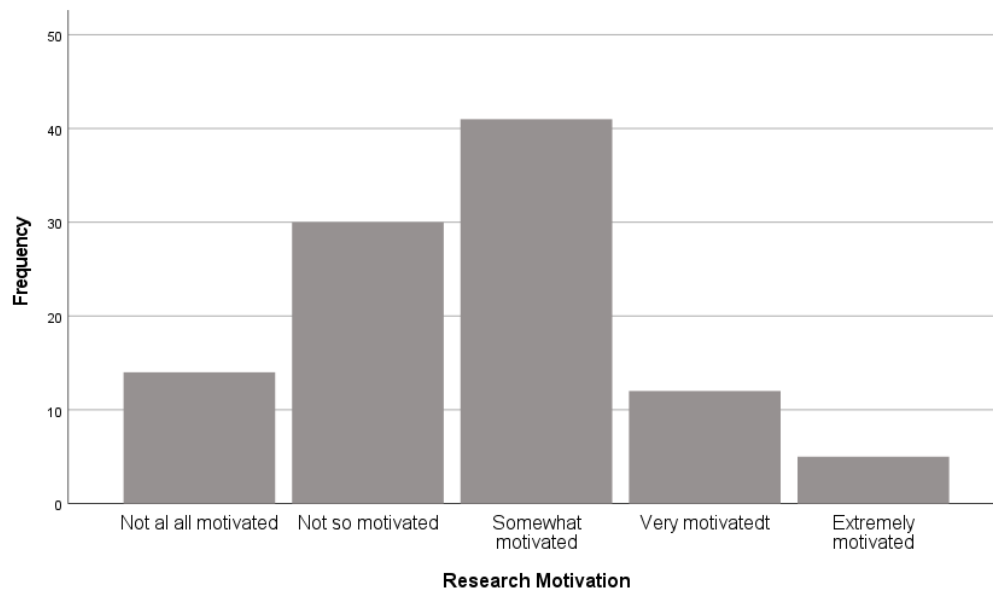
**Table 19**

*Summary Statistics Table for Research Motivation*

Variable	$n$	Min	Max	$M$	$SD$
Research Motivation	102	1.00	5.00	3.35	1.02

**Figure 12**

*Bar Chart for Research Motivation.*



***RQ6: What is the Research Practice of MNRI® Core® Specialists, as measured by the Wessex Network Research Spider?***

Research Practice scores ranged from 1.00 to 5.00, with  $M = 2.16$  and  $SD = 0.84$ . The mean score indicates that participants collectively had little experience. The Research Practice scale also met the acceptable threshold for internal consistency ( $\alpha = .94$ ). The summary statistics for Research Practice are presented in **Table 20**. **Figure 13** presents a histogram of the Research Practice scores.

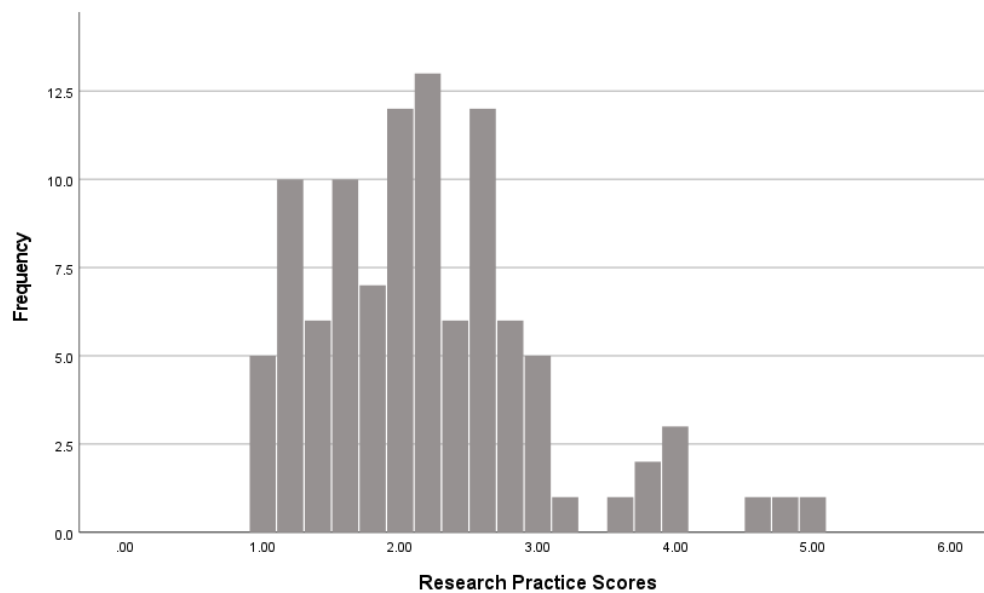
**Table 20**

*Summary Statistics Table for Research Practice*

Variable	$n$	Min	Max	$M$	$SD$	Number of items	$\alpha$
Research Practice	102	1.00	5.00	2.16	0.84	10	.94

**Figure 13**

*Histogram for Research Practice.*



***RQ7: Is there a relationship between Educational Degree, Research Knowledge, Research Attitude, and Research Practice? (ED-RK, ED-RA, ED-RP)***

**RQ7a:** Is there a relationship between Educational Degree and Research Knowledge?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Knowledge.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Knowledge.

**RQ7b:** Is there a relationship between Educational Degree and Research Attitude?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Attitude.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Attitude.

**RQ7c:** Is there a relationship between Educational Degree and Research Practice?

**H<sub>0</sub>:** There is no relationship between Educational Degree and Research Practice.

**H<sub>a</sub>:** There is a relationship between Educational Degree and Research Practice.

A series of Spearman correlations were conducted to examine the strength of the relationship between Educational Degree, Research Knowledge, research attitude, and Research Practice. The Spearman correlation between Educational Degree and Research Knowledge was not statistically significant,  $r_s(102) = .16, p = .101$ . The Spearman correlation between Educational Degree and Research Attitude was not statistically significant,  $r_s(102) = .17, p = .082$ . The Spearman correlation between Educational Degree and Research Practice was statistically significant,  $r_s(102) = .38, p < .001$ . Applying Cohen's standard (Cohen, 1988), the strength of the relationship between Educational Degree and Research Practice represented a moderate association. The positive correlation coefficient indicates that higher Educational

Degree was associated with higher Research Practice scores. **Table 21** presents the results of the Spearman correlations. Scatterplots for the relationships are presented in Figures 14-16.

**Table 21**

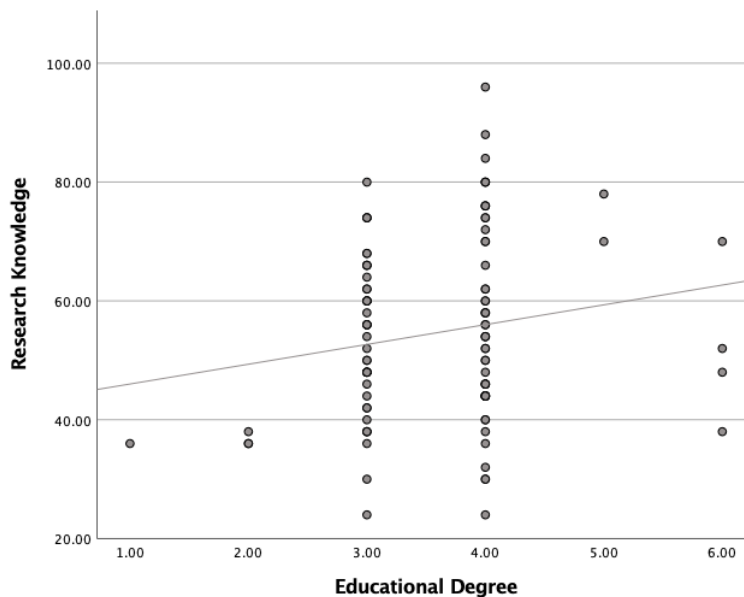
*Spearman Correlations Between Educational Degree, Research Knowledge, Research Attitudes, and Research Practice*

Variable	Educational Degree	
	$r_s(102)$	$p$
Research Knowledge	.16	.101
Research Attitude	.17	.082
Research Practice	.38*	<.001

\*Denotes significant correlation,  $p < .05$ .

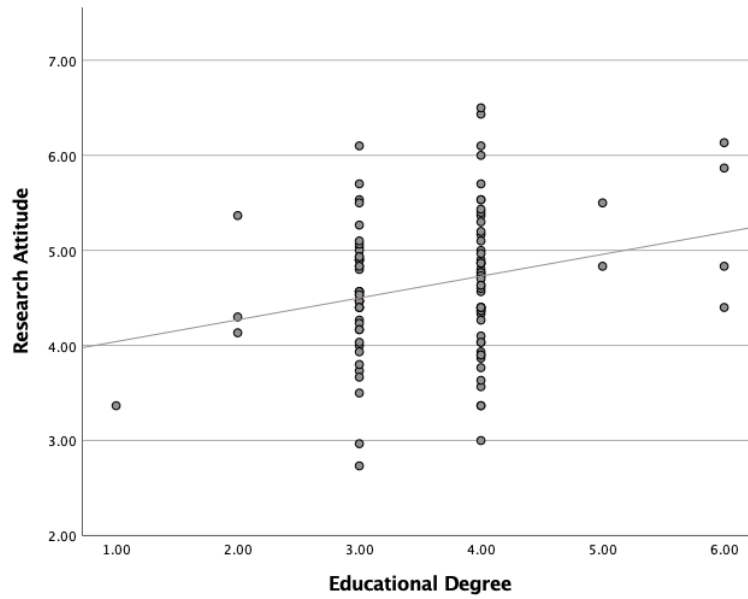
**Figure 14**

*Scatterplot Between Highest Educational Degree and Research Knowledge.*

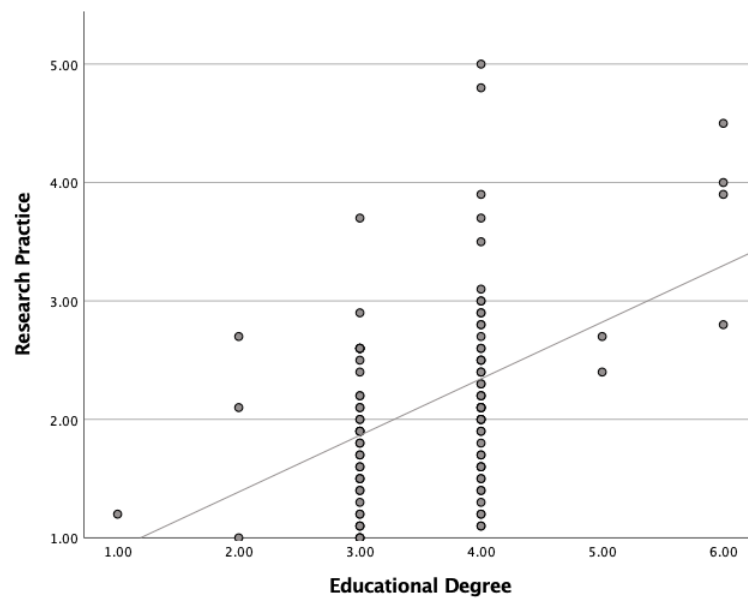


**Figure 15**

*Scatterplot Between Highest Educational Degree and Research Attitude.*

**Figure 16**

*Scatterplot Between Highest Educational Degree and Research Practice.*



**RQ8: Is there a relationship between Years of Professional Experience and Research Knowledge, Research Attitude, and Research Practice? (YOE-RK, YOE-RA, YOE-RP)**

**RQ8a:** Is there a relationship between Years of Professional Experience and Research Knowledge?

$H_0$ : There is no relationship between Years of Professional Experience and Research Knowledge.

$H_a$ : There is a relationship between Years of Professional Experience and Research Knowledge.

**RQ8b:** Is there a relationship between Years of Professional Experience and Research Attitude?

$H_0$ : There is no relationship between Years of Professional Experience and Research Attitude.

$H_a$ : There is a relationship between Years of Professional Experience and Research Attitude.

**RQ8c:** Is there a relationship between Years of Professional Experience and Research Practice?

$H_0$ : There is no relationship between Years of Professional Experience and Research Practice.

$H_a$ : There is a relationship between Years of Professional Experience and Research Practice.

A series of Pearson correlations were proposed to examine the strength of the relationship between Years of Professional Experience, Research Knowledge, Research Attitude, and

Research Practice. Normality was assessed using a Kolmogorov-Smirnov test on each of the variables. The assumption of normality was supported for Research Knowledge ( $p = .077$ ) and Research Attitude ( $p = .200$ ). The assumption of normality was not supported for Years of Professional Experience ( $p < .001$ ) and Research Practice ( $p = .020$ ). The results of the Kolmogorov Smirnov tests for the variables are presented in **Table 22**.

**Table 22**

*Kolmogorov-Smirnov Tests for Variables of Interest*

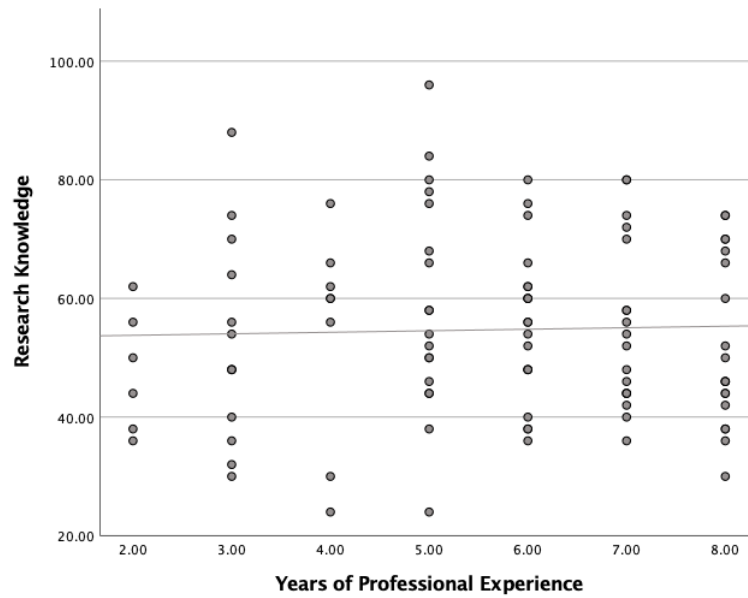
Variable	Kolmogorov-Smirnov Test	
	Test Statistic	$p$
Years of Professional Experience	0.15	<.001*
Research Knowledge	0.08	.077
Research Attitudes	0.06	.200
Research Practice	0.10	.020*

\*Denotes significant Kolmogorov-Smirnov test,  $p < .05$ .

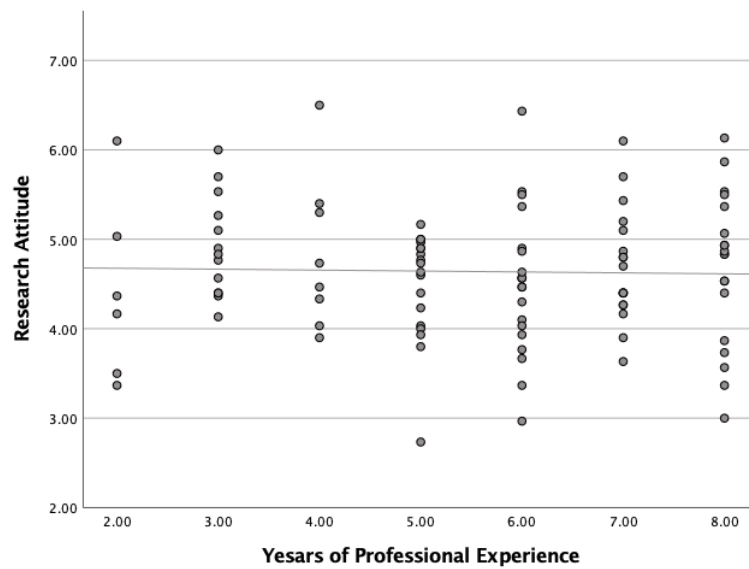
The assumption of linearity was tested with a series of scatterplots (see **Figures 17-19**). There was not a clear positive or negative trend in the scatterplots, indicating that the assumption of linearity was not supported. Due to the assumptions of normality and linearity not being supported, a series of Spearman correlations were conducted as an alternative to the originally proposed Pearson correlations.

**Figure 17**

*Scatterplot Between Years of Professional Experience and Research Knowledge.*

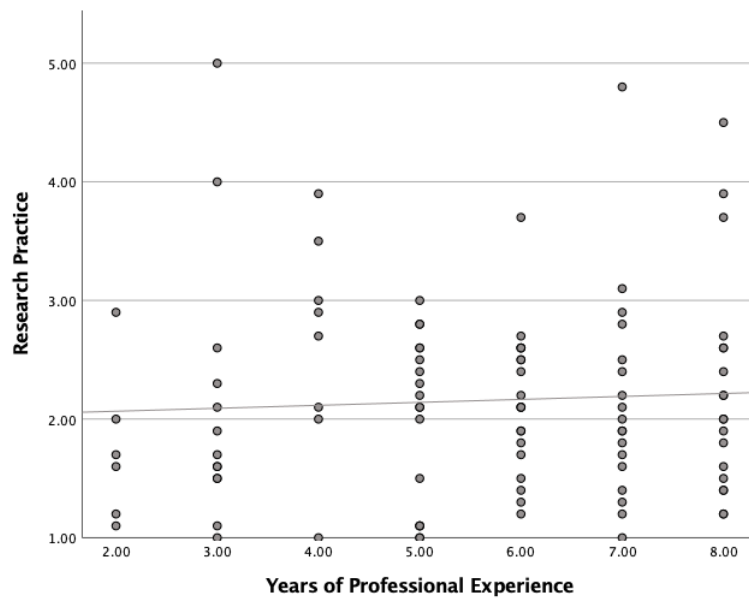
**Figure 18**

*Scatterplot Between Years of Professional Experience and Research Attitude.*



**Figure 19**

*Scatterplot Between Years of Professional Experience and Research Practice.*



The Spearman correlation between Years of Professional Experience and Research Knowledge was not statistically significant,  $r_s(102) = .00, p = .977$ . The Spearman correlation between Years of Professional Experience and Research Attitude was not statistically significant,  $r_s(102) = .00, p = .975$ . The Spearman correlation between Years of Professional Experience and Research Practice was not statistically significant,  $r_s(102) = .06, p = .584$ . The findings of the Spearman correlations are presented in **Table 23**.

**Table 23**

*Spearman Correlations Between Years of Professional Experience, Research Knowledge, Research Attitudes, and Research Practice*

Variable	Years of professional experience	
	$r_s(102)$	$p$
Research Knowledge	-.00	.977
Research Attitude	.00	.975
Research Practice	.06	.584

**RQ9:** *Is there a relationship between each domain pairing? (RK-RA, RK-RP, RA-RP)*

**RQ9a:** Is there a relationship between Research Knowledge and Research Attitude?

$H_0$ : There is no relationship between Research Knowledge and Research Attitude.

$H_a$ : There is a relationship between Research Knowledge and Research Attitude.

**RQ9b:** Is there a relationship between Research Knowledge and Research Practice?

$H_0$ : There is no relationship between Research Knowledge and Research Practice.

$H_a$ : There is a relationship between Research Knowledge and Research Practice.

**RQ9c:** Is there a relationship between Research Attitude and Research Practice?

$H_0$ : There is no relationship between Research Attitude and Research Practice.

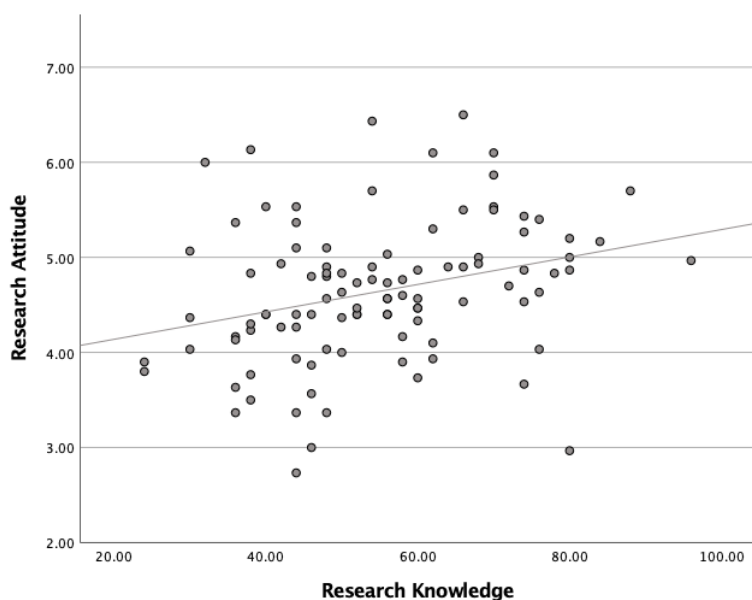
$H_a$ : There is a relationship between Research Attitude and Research Practice.

A series of Pearson correlations were proposed to examine the strength of the relationship between Research Knowledge, Research Attitude, and Research Practice. Normality was assessed in the previous research question using a series of Kolmogorov-Smirnov tests. The assumption of normality was not supported for Research Practice ( $p = .020$ ).

The assumption of linearity was tested with a series of scatterplots (see **Figures 20-22**). There appeared to be a positive relationship between all of the variables of interest, indicating that the assumption of linearity was supported. However, due to the assumptions of normality not being supported, a series of Spearman correlations were conducted as an alternative to the originally proposed Pearson correlations.

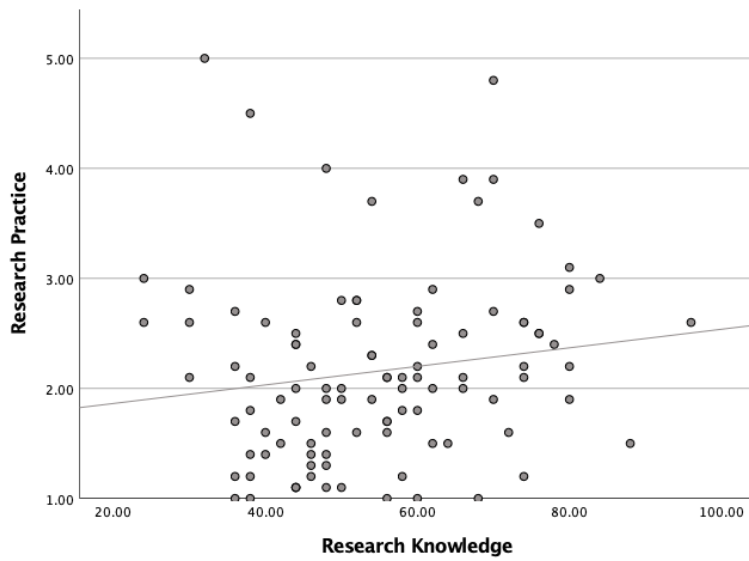
**Figure 20**

Scatterplot Between Years of Research Knowledge and Research Attitude.

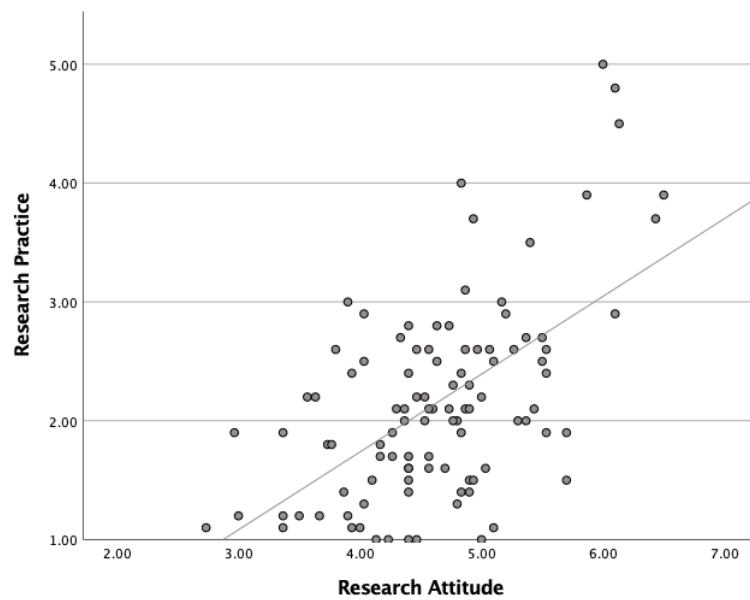


**Figure 21**

*Scatterplot Between Years of Research Knowledge and Research Practice.*

**Figure 22**

*Scatterplot Between Research Attitudes and Research Practice.*



The Spearman correlation between years of Research Knowledge and Research Attitudes was statistically significant,  $r_s(102) = .35, p < .001$ . The Spearman correlation between Research Knowledge and Research Practice was statistically significant,  $r_s(102) = .22, p = .030$ . The Spearman correlation between Research Attitudes and Research Practice was statistically significant,  $r_s(102) = .48, p < .001$ . The relationships ranged from small to moderate. All the correlations were positive, indicating that as one variable increased, the second variable also tended to increase. The findings of the Spearman correlations are presented in **Table 24**.

**Table 24**

*Spearman Correlations between Research Knowledge, Research Attitudes, and Research Practice*

Variable	Research Knowledge		Research Attitudes		Research Practice	
	$r_s(102)$	$p$	$r_s(102)$	$p$	$r_s(102)$	$p$
Research Knowledge	1.00	-				
Research Attitudes	.35*	<.001	1.00	-		
Research Practice	.22*	.030	.48*	<.001	1.00	-

\*Denotes significant correlation,  $p < .05$ .

### Post-Hoc Power Analyses

A post-hoc power analysis was conducted for each of the inferential research questions (RQ7, RQ8, and RQ9) using G\*Power 3.1.9. The *a priori* power analysis conducted in the methodology chapter utilized a power of .88 for the Spearman correlations. The achieved power for the Spearman correlations exceeded .88 for parts of research question seven and research question nine. The achieved power for the remaining analyses fell below .88, indicating that the findings should be interpreted with a level of caution. The post-hoc power analyses for the statistical analyses are presented in **Table 25**.

**Table 25***Post-hoc Power Analyses*

Research Question	Variable	$r_s(102)$	$p$	Post-hoc power analysis
7a	Is there a relationship between <u>Educational Degree</u> and <u>Research Knowledge</u> ?	.16	.101	.37
7b	Is there a relationship between <u>Educational Degree</u> and <u>Research Attitude</u> ?	.17	.082	.41
7c	Is there a relationship between <u>Educational Degree</u> and <u>Research Practice</u> ?	.38	<.001	.98*
8a	Is there a relationship between <u>Years of Professional Experience</u> and <u>Research Knowledge</u> ?	-.00	.977	.05
8b	Is there a relationship between <u>Years of Professional Experience</u> and <u>Research Attitude</u> ?	.00	.975	.05
8c	Is there a relationship between <u>Years of Professional Experience</u> and <u>Research Practice</u> ?	.06	.584	.09
9a	Is there a relationship between <u>Research Knowledge</u> and <u>Research Attitude</u> ?	.35	<.001	.96*
9b	Is there a relationship between <u>Research Knowledge</u> and <u>Research Practice</u> ?	.22	.030	.62**
9c	Is there a relationship between <u>Research Attitude</u> and <u>Research Practice</u> ?	.48	<.001	.99*

\*Denotes significant correlation,  $p < .05$  and achieved power greater than .88.

\*\*Denotes significant correlation,  $p < .05$  and power below .88.

**Review of Hypothesis (Reject the Null or Fail to Reject the Null)**

The null hypothesis was rejected for RQ7c, RQ9a, RQ9b, and RQ9c. The null hypothesis was not rejected for RQ7a, RQ7b, RQ8a, RQ8b, and RQ8c.

**Research Question 7a and Alternative Hypothesis.** For the following, the null hypothesis was not rejected.

**RQ7a:** Is there a relationship between Educational Degree and Research Knowledge?

$H_0$ : There is no relationship between Educational Degree and Research Knowledge.

**Research Question 7b and Alternative Hypothesis.** For the following, the null hypothesis was not rejected.

**RQ7b:** Is there a relationship between Educational Degree and Research Attitude?

$H_0$ : There is no relationship between Educational Degree and Research Attitude.

**Research Question 7c and Alternative Hypothesis.** For the following, the null hypothesis was rejected. The alternative hypothesis is accepted:

**RQ7c:** Is there a relationship between Educational Degree and Research Practice?

$H_a$ : There is a relationship between Educational Degree and Research Practice.

**Research Question 8a and Alternative Hypothesis.** For the following, the null hypothesis was not rejected.

**RQ8a:** Is there a relationship between Years of Professional Experience and Research Knowledge?

$H_0$ : There is no relationship between Years of Professional Experience and Research Knowledge.

**Research Question 8b and Alternative Hypothesis.** For the following, the null hypothesis was not rejected.

**RQ8b:** Is there a relationship between Years of Professional Experience and Research Attitude?

**H<sub>0</sub>:** There is no relationship between Years of Professional Experience and Research Attitude.

**Research Question 8c and Alternative Hypothesis.** For the following, the null hypothesis was not rejected.

**RQ8c:** Is there a relationship between Years of Professional Experience and Research Practice?

**H<sub>0</sub>:** There is no relationship between Years of Professional Experience and Research Practice.

**Research Question 9a and Alternative Hypothesis.** For the following, the null hypothesis was rejected. The alternative hypothesis is accepted:

**RQ9a:** Is there a relationship between Research Knowledge and Research Attitude?

**H<sub>a</sub>:** There is a relationship between Research Knowledge and Research Attitude.

**Research Question 9b and Alternative Hypothesis.** For the following, the null hypothesis was rejected. The alternative hypothesis is accepted:

**RQ9b:** Is there a relationship between Research Knowledge and Research Practice?

**H<sub>a</sub>:** There is a relationship between Research Knowledge and Research Practice.

**Research Question 9c and Alternative Hypothesis.** For the following, the null hypothesis was rejected. The alternative hypothesis is accepted:

**RQ9c:** Is there a relationship between Research Attitude and Research Practice?

**H<sub>a</sub>** : There is a relationship between Research Attitude and Research Practice.

**Table 26** presents a summary of the hypothesis testing.

**Table 26**

*Summary for Hypothesis Testing*

Research Question	Variable	$r_s(102)$	$p$	Reject the Null or Fail to Reject Null
7a	Is there a relationship between <u>Educational Degree</u> and <u>Research Knowledge</u> ?	.16	.101	Fail to Reject
7b	Is there a relationship between <u>Educational Degree</u> and <u>Research Attitude</u> ?	.17	.082	Fail to Reject
7c	Is there a relationship between <u>Educational Degree</u> and <u>Research Practice</u> ?	.38	<.001	Reject
8a	Is there a relationship between <u>Years of Professional Experience</u> and <u>Research Knowledge</u> ?	-.00	.977	Fail to Reject
8b	Is there a relationship between <u>Years of Professional Experience</u> and <u>Research Attitude</u> ?	.00	.975	Fail to Reject
8c	Is there a relationship between <u>Years of Professional Experience</u> and <u>Research Practice</u> ?	.06	.584	Fail to Reject
9a	Is there a relationship between <u>Research Knowledge</u> and <u>Research Attitude</u> ?	.35	<.001	Reject
9b	Is there a relationship between <u>Research Knowledge</u> and <u>Research Practice</u> ?	.22	.030	Reject
9c	Is there a relationship between <u>Research Attitude</u> and <u>Research Practice</u> ?	.48	<.001	Reject

## Qualitative Data Analysis

The survey study included three open-ended questions to examine RQ10. The purpose of the open-ended questions was to give context to MNRI® Core Specialists' Research Knowledge, Attitude, and Practice by identifying perceived barriers and enabling factors to research in The Masgutova Method®. Qualitative and quantitative data collection occurs simultaneously from the same participants in a concurrent mixed-methods design. Therefore, participant demographics are identical for both the quantitative and qualitative data. The online survey included the following three open-ended questions:

**Survey Question 63:** *In your opinion, what are the barriers to conducting research in The Masgutova Method®?*

**Survey Question 66:** *In your opinion, what do you believe is necessary to be a successful researcher of The Masgutova Method®?*

**Survey Question 65:** *Is there anything else you would like to add regarding research in The Masgutova Method®?*

### Positionality Statement.

The positionality of the PI influences every phase of the research process. Therefore, this analysis my constructed interpretation of the study participants' responses shaped by my standpoint as an experienced US-based occupational therapist in private practice with training and experience in Sensory Integration Theory and Intervention. In addition, I am both a student and instructor of The Masgutova Method®. Finally, my personal demographics align with many of the majority groups found in the demographics of the study's participants: white, age 35-44, and female.

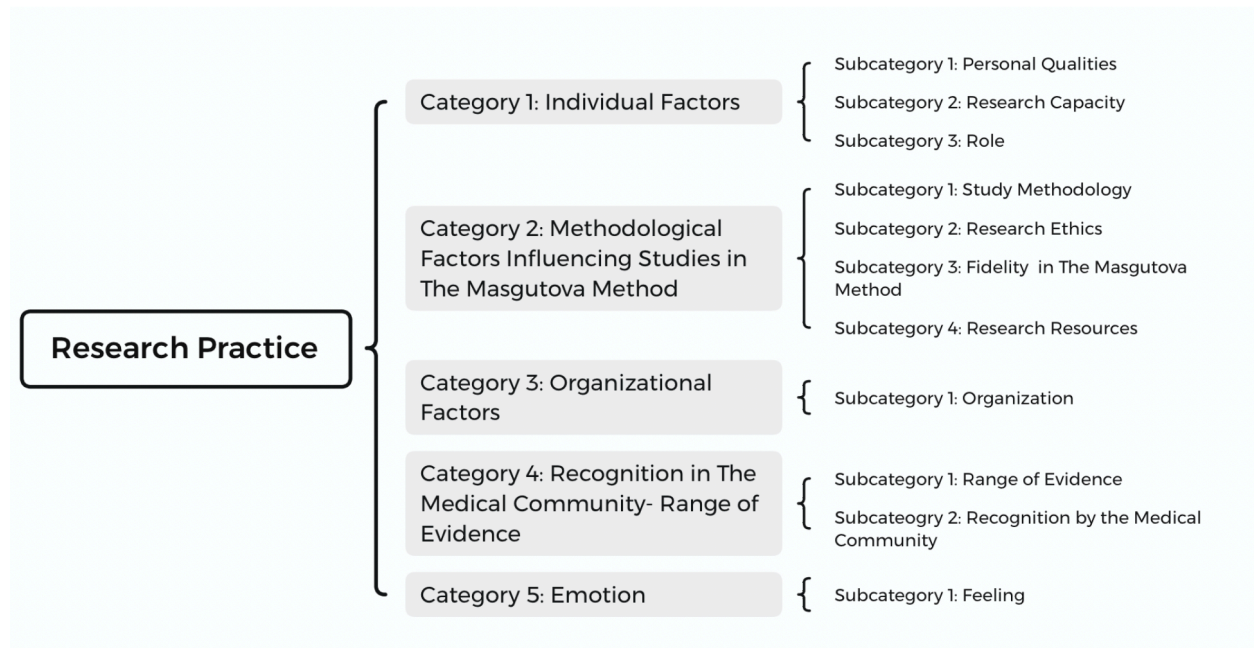
***RQ10: What are the barriers and facilitating factors to conducting research in The Masgutova Method® as identified by MNRI® Core Specialists?***

To explore RQ10, I analyzed participant responses to the three open-ended survey questions utilizing methods derived from qualitative research methodology and described in Chapter III: Methodology. The results discussed are the categories and sub-categories that emerged during the data analysis process regarding barriers and facilitating factors to research in The Masgutova Method®. In addition to categories and sub-categories, two preliminary themes emerged from the data analysis.

Five overarching categories and eleven sub-categories emerged from the three open-ended questions during the data analysis process. **Figure 23** illustrates the emerging categories and sub-categories from the data analysis process.

**Figure 23**

*Concept Map Illustrating Emerging Categories & Sub-Categories*



**Table 27** summarizes the five categories regarding research feasibility in The Masgutova Method®.

**Table 27**

*Categories Emerged During Data Analysis of Open-Ended Questions*

Category Number	Category	Definition
1	Individual Factors	A category that helps organize sub-categories that apply to factors at the micro, person-level. Sub-categories on the individual level included Personal Qualities, Research capacity, and Role.
2	Methodological Factors Influencing Studies in The Masgutova Method®	A category that helps organize subcategories that apply to factors influencing researching The Masgutova Method® specifically. Subcategories on this level included Study Methodology, Research Ethics, Fidelity of The Masgutova Method®, and Research Resources.
3	Organizational Factors	A category that helps organize subcategories that apply to factors external to the individual. Organization was the only sub-category on this level.
4	Recognition in the Medical Community: Range of Evidence	A category helps organize subcategories that apply to credibility in the medical community and evidence-based practice. Subcategories on this level included Range of Evidence and Recognition by the Medical Community.
5	Emotion	A category helps organize subcategories that apply to how someone feels. Feeling is the only sub-category that emerged on this level.

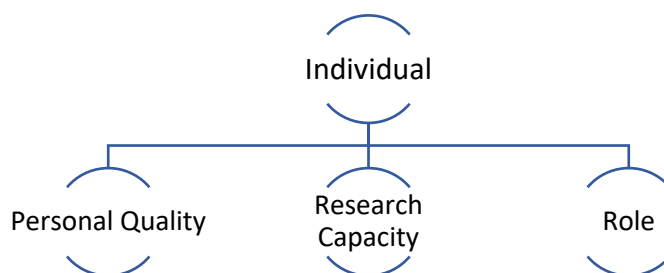
Five categories emerged regarding barrier and facilitating factors to research in The Masgutova Method®

### Individual Factors.

*Individual Factors* is the category that helps organize subcategories that apply to factors at the micro, person-level. Subcategories on the individual level included *Personal Qualities*, *Research Capacity*, and *Role*. **Figure 24** illustrates subcategories for *Individual Factors*.

**Figure 24**

*Sub-categories for Individual Factors*



### *Personal Quality.*

*Personal Quality* is a sub-category that helps organize codes that apply to individual characteristics expressed by a participant as an attribute that can act as a barrier or facilitating factor to research. Personal qualities are an individual's unique characteristics or attributes. Participants frequently listed *Personal Qualities* as a single word, such as *dedication* or *interest*. Examples of *Personal Quality* include:

- “Excellent Communication Skills” (Educator, Female, International)
- “Dedication” (Social Worker, Female, US)
- “The desire to want to be” (Educator, Female, US)
- “Critical Thinking” (OT, Male, International)
- “The English Language” (Educator, Female, Netherlands)

- “For my personal situation, there is also the age factor” (OT, Male, International)

*Research Capacity.*

*Research Capacity* is a sub-category that helps to organize codes that apply to individual characteristics necessary for research competence. Codes that emerged in this sub-category are related to the study’s conceptual framework Research Knowledge, Research Attitude, & Research Practice. Examples of *Research Capacity* include:

- “Know how to conduct quality research” (Educator, Female, International)
- “Adequate research methods training” (SLP, Female, US)
- “I value research in The Masgutova Method but don't feel I have the skills and knowledge to do a professional and worthy job” (OT, Female, US)
- “Knowledge of how to complete a successful research study” (PT, Female, US)

*Role.*

*Role* is a sub-category that helps to organize codes that apply to a “socially expected behavior pattern” assumed by an individual (Merriam-Webster, 2022a). Examples of *Role* include:

- “I graduated from college with my MA nine years ago, and while I can recognize if research could be valid, I have not focused on research skills at all. My concentration has been on technique and application of therapy. In order to balance my life, I need to choose to be an academic, or a therapist.” (PT, Female, US)
- “It also has to be your thing. I think I can support but not be the leading person, not my world” (Nurse/Play Therapists, Female, Netherlands)

### **Methodological factors influencing studies in The Masgutova Method®.**

Methodological factors influencing studies in The Masgutova Method® is a category that helps organize subcategories that apply to factors influencing studies in The Masgutova Method® specifically (Sage Publications, Ltd., 2019). Subcategories on this level included *Study Methodology*, *Research Ethics*, *Fidelity of The Masgutova Method®*, and *Research Resources*. **Figure 25** illustrates Subcategories for Methodological Factors Influencing Studies in The Masgutova Method®.

**Figure 25**

*Subcategories for Methodological Factors Influencing Studies in The Masgutova Method®*



#### *Study Methodology.*

Study Methodology is a sub-category that helps to organize codes that apply to factors that will influence the planning, design, and execution of a research study. Examples of *study methodology* include:

- “With a hands-on method such as MNRI®, it is very challenging to engage quantitative research approaches, so, in my opinion, focus should be on the

qualitative methods” (Psychologist, Teacher, Sports Science, Cognitive Neuroscience, Female, Sweden)

- “Setting up controlled conditions for the research that isolate the value of MNRI®” (SLP, Female, US)
- “The reflex assessment tool is not available to all” (Psychologist, Female, US)
- “Lack of a consistent grading scale for individual reflexes” (OT, Female, US)
- “The influence of other therapy techniques in the same time period” (SLP, Female, US)
- “The main problem with obtaining a clinical trial permit is a long process of negotiating contracts.” (Educator, Female, International)

#### *Research Ethics.*

*Research Ethics* is a sub-category that helps to organize codes that apply to standards of conduct for researchers that protect the dignity, rights, and welfare of research participants and uphold the principle of beneficence, justice, and autonomy (World Health Organization [WHO], 2021). Examples of *Research Ethics* include:

- “Having a control subject who would NOT receive MNRI®” (PT, Female, US)
- “Ethics of blinding & placebos vs meeting Children’s needs as a priority over research” (Educator, Female, US)

#### *Fidelity of The Masgutova Method®.*

*Fidelity of The Masgutova Method®* is a category that helps organize codes that apply to “faithfulness of intervention to underlying therapeutic principles” (Parham et al., 2007, p. 216). Examples of *Fidelity of The Masgutova Method®* include:

- “Quality of touch, accuracy of techniques, experience of therapist providing treatment” (OT, Female, US)
- “Consistency of treatment” (OT, Female, France)
- “Education in the method” (PT, Female, US)

#### *Research Resources.*

Research Resources is a category that helps to organize codes that apply to physical supplies, personnel, and other factors needed to execute research. Examples of *research resources* include:

- “Lack of funding” (OT, Male, International)
- “Time away from patient care and financial disincentive” (OT, Female, US)
- “Clinical treatment time taking up the time that could be used for research” (Massage Therapists, Female, US)
- “Equipment[sic] for assessment pre and post-tests” (OT, Female, US)
- “I personally find I cannot devote a large block of time to research” (Educator, Male, US)

#### **Organizational Factors.**

**Organizational Factors** is a category that helps organize subcategories that apply to factors external to the individual (Sage Publications, Ltd., 2019). *Organization* was the only sub-category on this level. **Figure 26** illustrates the sub-categories for organizational factors.

**Figure 26**

*Sub-categories for Organizational Factors*



*Organization.*

Organization is a sub-category that helps organize codes that apply to factors related to The Svetlana Masgutova Educational Institute, LLC (SMEI, LLC). SMEI is the United States organization responsible for certifying MNRI® Core Specialists and is the only US-based continuing education provider in The Masgutova Method®. Examples of *Organization* include:

- “Clear Direction of Organization” (Educator, Female, US)
- “Lack of assistance developing studies/analyzing data” (OT, Female, US)
- “Should not force people to do research” (Computer Technology, Male, France)
- “Training to do research and requirements to do so, although that might eliminate even more practitioners from becoming core specialists.” (Educator, Female, US)
- “There needs to be a balance between the organization funding research and providing as much training to as diverse a population.” (OT, Female, US)

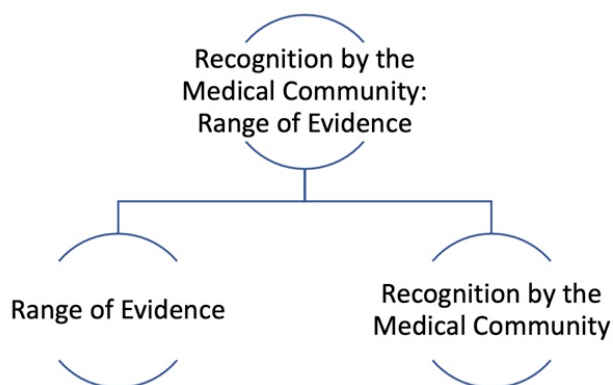
**Recognition in the Medical Community: Range of Evidence.**

Recognition in the medical community: Range of evidence is a category that helps organize sub-categories that apply to factors credibility in the medical community and evidence-

based practice (Sage Publications, 2019). Sub-categories on this level included *Range of Evidence* and *Recognition by the Medical Community*. **Figure 27** illustrates sub-categories for *Recognition by the Medical Community: Range of Evidence*.

**Figure 27**

*Sub-categories for Recognition by the Medical Community: Range of Evidence*



*Range of Evidence.*

*Range of evidence* is a sub-category that helps organize codes that apply to the continuum of evidence supporting The Masgutova Method®. Examples of *Range of Evidence* include:

- “We also need peer reviewed articles. I believe it would be helpful to have an unbiased, scientific review board of qualified professionals with research experience for MNRI®.” (Audiologist, Female, US)
- “The individual’s ability to translate the research” (Holistic Health Practitioner, Female, US)

- “I hope an experienced researcher can bring traditional evidence-based studies to the world to show the success that The Masgutova method presents” (Educator, Female, US)
- “I have about 500 documented clients from the last 10 years in my clinic, all recorded, and only statistical processing would be required of course not in English :)” (PT, Female, Slovenia)
- “It is valuable because this method has far superior real-life results than typical therapy results.” (OT, Female, US)

*Recognition by the Medical Community.*

*Recognition by the medical community* is a sub-category that helps organize codes that apply to the continuum of evidence supporting The Masgutova Method®. Examples of

*Recognition by the Medical Community* include:

- “Solid research with objective data would help us to make a name for ourselves in the medical community.” (PT, Female, US)
- “It needs to be seen in journals that are universally accepted” (PT, Female, US)
- “We need more randomized, controlled studies. This may limit our sample size due to matching for certain variables, but medical science will not recognize us without this.” (Audiologist, Female, US)

### **Emotion.**

Emotion is a category that helps organize sub-categories (Sage Publications, 2019).

*Feeling* is the only sub-category that emerged on this level. **Figure 28** illustrates sub-categories for Emotion.

**Figure 28***Sub-categories for Emotion**Feeling.*

*Feeling* is a sub-category that helps to organize codes that apply to “an emotional state or reaction” (Merriam-Webster, 2022b). Examples of *Feeling* include:

- “I am excited for more quality research. I'm so very tired of PCPs stating that ‘this child's reflexes are fine.’ There is such a lack of understanding and awareness in the medical field of how reflexes impact function, and therefore limit PCPs signing scripts for therapy services.” (OT, Female, US)

### ***Preliminary Themes for Future Analysis***

The purpose of this study was to develop a baseline understanding of research knowledge, attitude, and practice that can be translated practically and applied programmatically to support future scholarship. Data analysis of the categories and sub-categories has the most immediate practical application to transition into practice. Therefore, most of the data analysis reported here focuses on this level of analysis: categories and subcategories. However, two *preliminary themes* are discussed briefly in this report. Other components are not noted here but will continue to be analyzed.

The interpretation of preliminary themes allowed the PI to begin to capture the essence of the data analysis. For example, Lincoln & Guba (1985, cited in Creswell, 2014, p. 200) summarized this stage as describing, “What were the lessons learned?” Two preliminary themes in this study include:

**Barriers And Facilitators to Research are Two Sides of the Same Coin.**

The first theme is *barriers and facilitators to research are two sides of the same coin*, which means ‘two things that are regarded as two parts of the same thing’ (Merriam-Webster, 2022c). The study survey questions directed the participants to address barriers in SQ63 and facilitators in SQ64. Despite this separation, the analysis revealed barriers and facilitators to be the same. Participants described factors as barriers to research and identified the same factor as facilitatory. For example, participant #33(ID 51) responded “time” as a barrier to research and “strong time” as a facilitator to research. In this example, when time is considered insufficient, it was reported as a barrier to research, while more time was reported as an enabling factor. **Figure 29** visually represents barriers and facilitators as “*two sides of the same coin*,” as expressed by study participants.

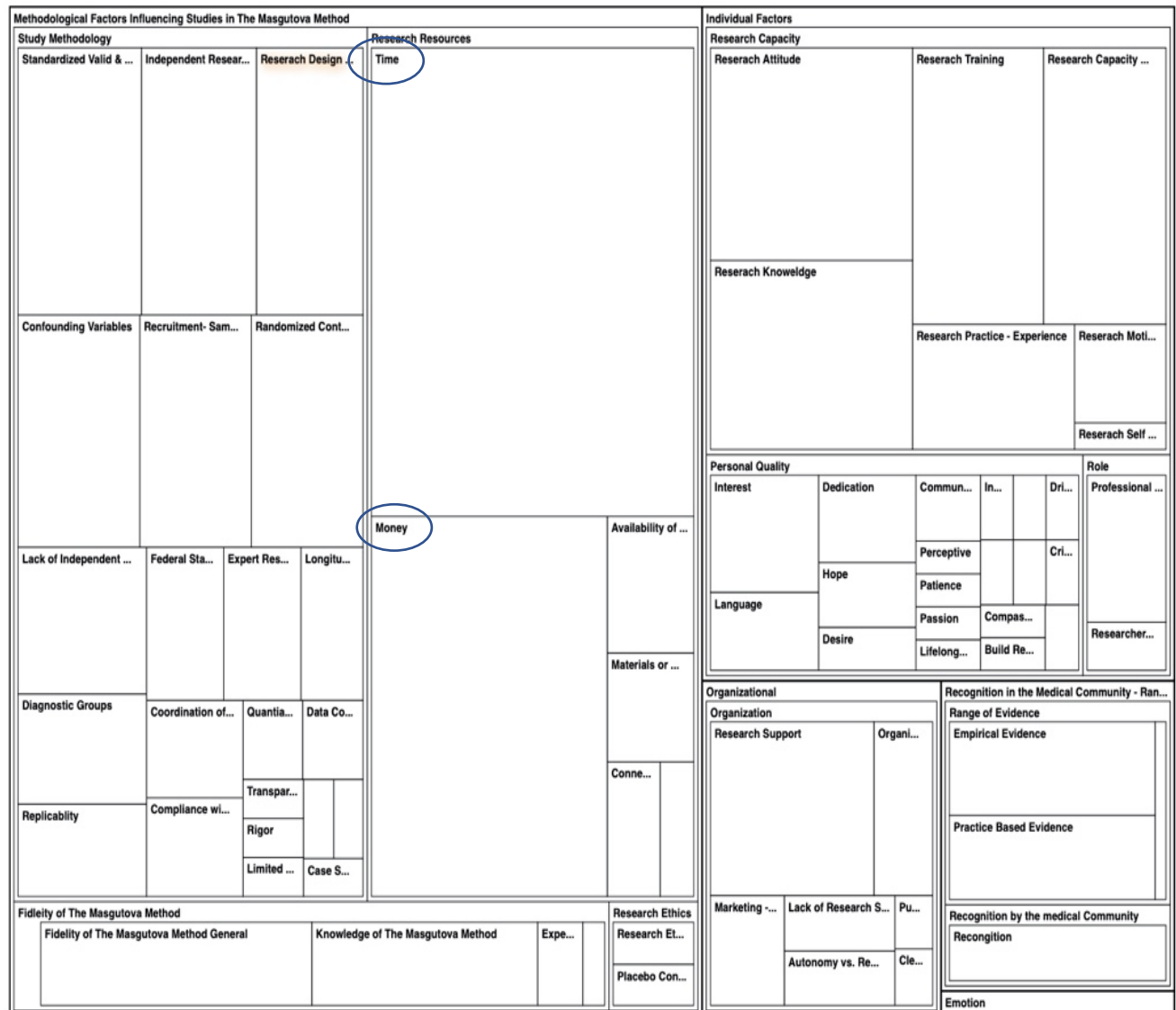
**Figure 29**

*Barrier and Facilitators to Research Are Two Sides of the Same Coin*



### **Time and Money Significantly Impact Research in The Masgutova Method®.**

The second preliminary theme is *time and money significantly impact research in The Masgutova Method®*. Participants reported *time* and *money* as two of the most influential *research resources* impacting research in The Masgutova Method®. **Figure 30** is a hierarchy chart that visually represents the weight of time and money in participant responses.



## Summary of Findings

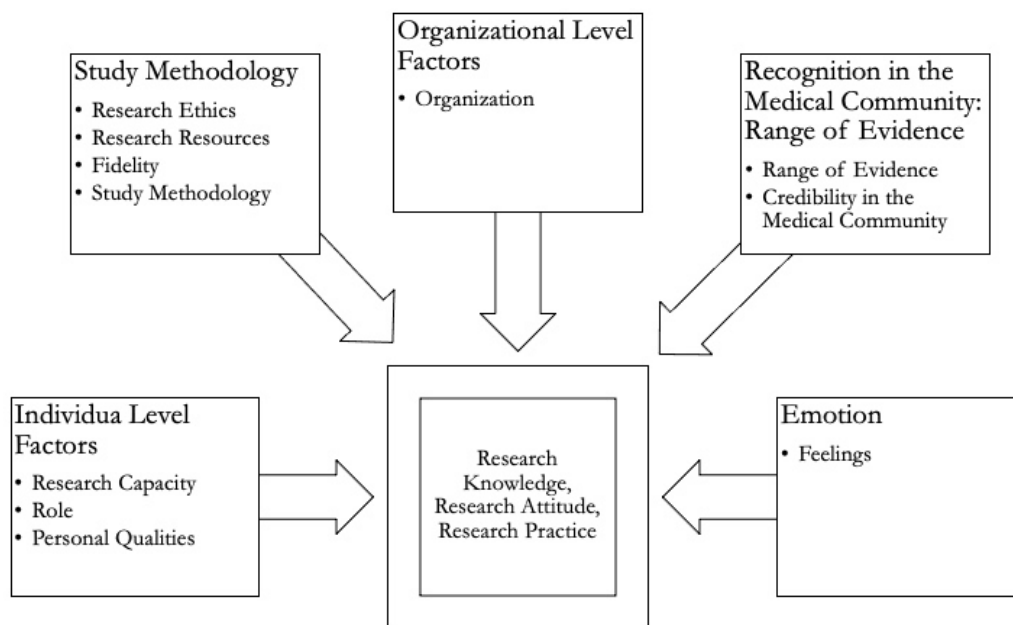
In summary, five overarching categories and eleven subcategories emerged from the qualitative analysis exploring barriers and facilitators to research in The Masgutova Method®. Additionally, two preliminary themes were presented. These categories, subcategories, and themes provide a context to understand MNRI® Core Specialist's *research practice*.

## Integration of Qualitative and Quantitative Analysis

This study does not meet the definition of a 'pure' mixed-methods design. A mixed-methods design measures all the domains and constructs quantitatively and qualitatively. In this *modified* mixed-methods design, research practice was the only domain analyzed quantitatively and qualitatively. More specifically, *research experience* was measured quantitatively, and *feasibility* (barriers and facilitators) was measured qualitatively. Following this, a direct comparison of *all* domains and constructs is not possible. However, qualitative data on *feasibility* provides a contextual understanding of barriers and facilitators to research in The Masgutova Method®. **Figure 31** provides a visual representation of the 5 main factors influencing MNRI® Core Specialists' research knowledge, research attitude, and research practice.

**Figure 31**

*Factors Influencing MNRI® Core Specialists' Research Knowledge, Research Attitude, & Research Practice*



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In the domain of *research practice*, this sample of MNRI® Core Specialists collectively reported limited research experience. Scores ranged from 1.00 to 5.00, with  $M = 2.16$  and  $SD = 0.84$ . This limited research experience occurs within the context of barriers and facilitating factors. Factors identified by the study participants included individual-level factors (personal qualities, research capacity, and role), methodological level factors (study methodology, research ethics, fidelity of The Masgutova Method®, research resources), organizational factors (organization), factors impacting recognition in the medical community (recognition and range of evidence) and emotion (feelings).

When expanding the integration of quantitative and qualitative data analysis beyond just *research practice* as a complete unit, the results of each separate analysis are compatible. This finding may, in part, be due to the positive correlation identified between each domain pairing and confirmed through the analysis of *RQ9*. Highlights of consistency between the quantitative and qualitative data include:

**Research Knowledge.** Research Knowledge scores ranged from 24.00 to 96.00, with  $M = 54.71$  and  $SD = 15.08$ . The mean indicates that the average Research Knowledge score was 54.71%. Although the authors of the RKA did not publish criteria for ranges of scores, when compared to a traditional school grading system, such as the Seton Hall University grading system, 54.71% indicates a poor performance (Seton Hall University, n.d.). Participants recognized a lack of research knowledge in their open-ended responses. For example, Participant 25# (ID 38) states that there is a "lack of knowledge as how to do research from the side of the clinician."

Importantly, participants self-identified as a clinician and not researchers. For example, Participant #59 (ID 87) stated: "But, my skills are in direct patient care, not doing research." Having MNRI® Core Specialists identify as clinicians may account for low research knowledge scores on the *Research Knowledge Assessment*©.

**Research Attitude- Agreeable.** Research Attitude scores ranged from 2.73 to 6.50, with  $M = 4.64$  and  $SD = 0.74$ . The mean of 4.64 indicates that participants were agreeable to the items regarding Research Attitude. Similarly, research attitude- agreeable was prevalent among participant responses. Participant #9 (ID 12) states: "research is necessary to promote the method."

**Self-Efficacy.** Most participants indicated that they were not at all confident ( $n = 31$ , 30.4%), not so confident ( $n = 29$ , 28.4%), or somewhat confident ( $n = 32$ , 31.4%) in their ability to conduct research. Participants frequently reported a lack of confidence in their ability to conduct research. Participant #56 (ID 83) states: "I value research in The Masgutova Method but don't feel I have the skills and knowledge to do a professional and worthy job."

**Research Motivation.** Most participants indicated that they were not so motivated ( $n = 30$ , 29.4%) or somewhat motivated ( $n = 41$ , 10.2%) in their ability to conduct research. However, research motivation did emerge as a code under research capacity. Participants report research motivation as being an enabling factor to research. For example, Participant #77 (ID 105) listed "motivation" as an enabling factor for research. Participants did not directly report a lack of research motivation in the open-ended questions, although several mentioned having no interest in actively participating in research.

**Research Practice.** The quantitative analysis measured *research practice* as the *research experience* of MNRI® Core specialists. *Research Practice* scores ranged from 1.00 to 5.00, with  $M = 2.16$  and  $SD = 0.84$ . The mean score indicates that participants collectively had little experience. Participants reaffirmed a lack of research experience in their open-ended responses. Participant #63 (ID 91) stated: "I have never conducted any research."

Limited *research experience* was also evident in the terminology chosen by participants. For example, participants frequently described factors influencing research but never referred to them as confounding variables. For example, Participant #56 (ID 83) stated: "In my practice I also use a variety of other techniques," and Participant #84 (ID 120) said: "There are many variables we cannot control such as what a child eats, how much they sleep, how much screen

time they get, how they are parented, other therapies they are receiving besides MNRI® and how they may impact the child, etc."

The next chapter will compare and contrast the quantitative and qualitative results with the existing scholarly literature. Next, a revision of the study's conceptual framework is presented based on the results of this study. Following the discussion of the study's conceptual framework, limitations are discussed. Finally, the chapter offers recommendations for future research and practice recommendations.

## Chapter V: DISCUSSION, RECOMMENDATION, AND CONCLUSIONS

This modified mixed-methods study aimed to establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice using a one-time, web-based questionnaire via Survey Monkey®. The study survey included three valid and reliable instruments. These included the *Research Knowledge Assessment*© (RKA), The *Attitude Toward Research Scale* (ATRS), and the *Wessex Research Network Spider*, also known as the *Research Spider*© (Lambie et al., 2014ab; Papanastasiou, 2005; Papanastasiou, 2014; & Smith et al., 2002). Drawing on the domain level Knowledge-Attitude-Practice Model as its theoretical framework, the conceptual framework, Research Knowledge-Attitude-Practice Model, guided this study. To answer the overarching research question: "What is the research knowledge, attitude, and practice of MNRI® Core Specialists?" ten sub-research questions were analyzed using methods derived from both quantitative and qualitative analysis.

Chapter V interprets the results of the data analysis with the existing scholarly literature. Next, the conceptual framework is reviewed and amended to reflect the findings of this study. Finally, limitations of the research study, suggestions for future research, and practical implications are discussed.

In addition to finding limited empirical evidence examining The Masgutova Method®, the literature review for this study revealed no empirical evidence exploring MNRI® Core Specialists' research knowledge, attitude, and practice. The currently available scholarly literature is limited to research exploring other allied health professions such as physical therapy, occupational therapy, and speech-language pathology. Therefore, these findings provide a novel contribution to the existing literature. This study facilitates an understanding of the research knowledge, attitude, and practice of MNRI® Core Specialists, explores barriers and facilitating

factors to research, and provides an initial understanding of the relationship between personal and demographic factors, and study variables, during one single point in time.

### **Expanding the Literature Review: Educators**

In this study, educators were the second largest professional group in the study sample of MNRI® Core Specialists ( $n = 20$ ), surpassing physical therapy ( $n = 17$ ) and speech-language pathologists ( $n = 9$ ). Consequently, a summary of research participation for educators was warranted. The literature examining teacher-educators, college, and university professors constituted most of the literature reviewed here. Evidence examining research in public and private elementary, middle, and high school educators was limited. Nevertheless, many similarities between allied health professionals and educators emerged during this expanded literature review.

### ***Similarities Between Allied Health Professional Research and Teacher Research***

The same research continuum exists in education as in medicine and allied health. The research continuum includes "engagement with research and engagement in research" (Kyaw, 2021, p. 2). The educational literature calls for university-based academic research and research generated by practicing teachers to formulate a more comprehensive knowledge base. Teacher research is "systematic and intentional inquiry carried out by teachers" (Cochran-Smith & Lytle, 1990, p. 3). In contrast, academic research is conducted "outside of the day-to-day practices of schooling" (Cochran-Smith & Lytle, 1990, p. 3).

The educational literature also emphasizes the importance of research to inform practice. The goal of research is similar for both allied health professionals and educators: (1) to "improve instructional practices" and (2) to "affect students' learning and achievement" (Martinovic, 2012,

p. 385). Finally, as in allied health and medicine, research capacity is a priority in education, especially for teacher educators (Griffiths et al., 2010)

Despite an emphasis on research, the literature on teacher research also identifies a “research/practice divide” (Martinovic et al., 2012, p. 386), also called the “research-practice gap” (McGann et al., 2020, p. 470), which is analogous to the evidence-practice gap in allied health and medicine (Cain, 2016; Sudsawad, 2007; IOM, 2001; van Schaik et al., 2018). For example, Williams and Coles (2007) examined teachers' approach to finding and using research in Scotland, England, and Wales, using a mixed-methods design. Despite a more positive attitude toward research, evidence-based practice was limited (pp. 191-198). Study participants identified “lack of time” and “lack of ready access to sources” as the primary barriers to research-informed teaching (p. 185).

The educational literature has also identified barriers to research-informed teaching. Barriers have included research culture in schools and the generalizability of research to real-life classroom situations (Broekkamp & Van Hout-Wolters, 2007). This finding is similar to barriers identified among allied health and medical professionals. Similarly, research culture and generalizability of the research are barriers to evidence-based practice in healthcare (O'Connor & Pettigrew, 2009; Borkowski et al., 2016).

Finally, the educational and allied health professional literature share some common theoretical underpinnings and suggestions for practice. For example, Knowledge Translation Theory is presented to help bridge the gap between evidence and research-informed practice (Greenspoon et al., 2014; Sudsawad, 2007). As a practical solution, action research/intervention research is offered as a tool to develop both clinician-investigators and teacher-researcher (Lytle & Cochran-Smith, 1992; Janssen et al., 2013; Broekkamp & Van Hout-Wolters, 2007). For

example, a study among pre-service educational students in the Philippines found that "real-world application of research skills" in participatory action research helped develop research competence (Toquero, 2021, p. 126). Finally, teacher research groups are presented as a practical way to establish "learning communities among teachers with the express purpose of systematically examining practice and enriching teachers' knowledge about learning and teaching" (Fairbanks & LaGrone, 2006, p. 7).

### ***Research Knowledge, Attitude, and Practice of Educators: A Brief Synopsis***

*Research Knowledge Among Teachers/Teacher Educators.* Research competence is reportedly low despite increased research training. Borg & Alshumaimeri (2012) examined Saudi Arabian university educators' research engagement. Among study participants, "I do not know enough about educational research methods" was the second most cited reason for not conducting research (p. 351). Despite an increase in focus on research competence, scholars continue to call for an increase in research competence development in teacher education and recognize challenges with research culture in schools (Saqipi & Vogrinc, 2020).

*Research Attitude Among Teachers and Teacher Educators.* Overall, teacher attitude toward research is more positive than negative, although variations exist (Cain, 2016). A positive attitude toward research is significant since a teacher's attitude can influence research engagement across the research continuum (Kosnik et al., 2015; Ping et al., 2018; Kyaw, 2021). Studies examining teacher educator research attitudes were more prevalent among the literature reviewed here than studies exploring K-12 educators. Teacher educators and university and college faculty may have a more positive attitude toward research.

Kosnik et al. (2015) examined literacy English teacher educators ( $n = 28$ ) in a cross-cultural sample using a primarily qualitative design. These university teacher educators from

Canada, England, and Australia indicated a positive attitude toward research. Study participants "considered knowledge of research essential because they needed to be able to conduct research, read research-based articles and draw on research in their teaching" (p. 61). In addition, study participants reported engagement in research throughout the research continuum (Kosnik et al., 2015).

Nasser-Abu Alhija & Majdob (2017) also explored teacher educators. In this study, Israeli teacher educators' ( $n = 161$ ) "attitudes towards research tended to be strongly positive" (Nasser-Abu Alhija & Majdob, 2017, p. 41). Similarly, Ping et al. (2018) conducted a literature review of teaching and teacher education. According to the authors, the results of this analysis revealed that "teacher educators valu[e] research knowledge and skills to strengthen their practices or contribute to their professional knowledge" (2018, p. 97).

A positive attitude toward research has also been explored in primary and secondary education. For example, Martinovic et al. (2012) explored education research among K-12 teachers ( $n = 547$ ). Over eighty percent of the study participants indicated that they would be interested in classroom or action research (p. 391). Similarly, nursery school teachers through secondary school teachers from Wales, Scotland, and England had a generally positive attitude toward research (Williams & Coles, 2007).

*Research Practice Among Teachers/Teacher Educators.* The literature has emphasized the importance of research engagement for several decades. In 1992, Lytle & Cochran-Smith presented *Teacher Research as a Way of Knowing*. In this article, the authors argue the need to expand a teachers' knowledge-based from one "that privileges only the knowledge of the university researcher" to one that "includes the emic perspective of the teacher researcher" (p. 447). Engagement in research remains low despite calls for teacher research (Borg &

Alshumaimeri, 2012; Šorgo & Heric; 2020). Even among teacher educators at the university level, modest research engagement has been reported (Borg & Alshumaimeri, 2012).

*Barriers and Facilitating Factors to Research Practice and Research Engagement Among Teachers/Teacher Educators.* The barriers and facilitating factors impacting teachers' and teacher educators' research participation include organizational support, individual research capacity, research culture, financial support, and time (Kyaw, 2021; Shamai & Kfir, 2002; Borg & Alshumaimeri, 2012).

Similarly, van Schaik et al. (2018) reviewed the literature on barriers and facilitating factors to teachers' research utilization. Four levels, and eleven subcategories, emerged as barriers and conditions to research utilization in education. Factors on the individual level included “teachers’ skills” and “attitude and perceptions of research knowledge” (p. 53). The research knowledge level included “accessibility of research knowledge” (p. 53). School-organization level included “organisational structure” and “organisational culture” (p. 53). Finally, the communication level included “teacher-researcher relationship” and “teacher-researcher collaboration” (p. 53).

Nasser-Abu Alhija & Majdob (2017) examined predictors for teacher-educators’ research productivity among teacher educators in Israel ( $n = 161$ ). "Motives" for research included “teaching improvement,” “commitment to college policy and culture,” “personal and professional development,” and “knowledge development and learning from research findings” (Nasser-Abu Alhija & Majdob, 2017, p. 41). "Obstacles" to research included “lack of resources and support,” “insufficient competence and self-confidence,” and “lack of time and/or interest” (Nasser-Abu Alhija & Majdob, 2017, p. 41). In this study, five personal and professional characteristics predicted research productivity: “academic degree, rank, administrative position,

desire to develop new knowledge and learn from research findings, and perceived insufficient research competence and self-confidence" (p. 34).

Barriers and enablers to research-based practice have also been explored among K-12 teachers ( $n = 547$ ). Using a mixed-methods design, Martinovic et al. (2012) found “pressures of time/workload,” and “lack of funding for training” as the most significant barriers (p. 392). Other barriers identified include “not understanding research methodology or research statistics, having difficulty accessing resources, lack of personal interest, lack of training and development policy, difficulties in implementing specific research-based practices, lack of administrative support, lack of relevant research, and lack of research culture in one’s school” (p. 392).

Finally, the majority of Slovenian K-12 teachers surveyed ( $n = 325$ ) indicated having a "high perceived self-confidence about their research abilities" (p. 90). However, only 24.6% reported research engagement. Intrinsic motivators such as “own satisfaction,” “own professional development,” “own wish to research,” “gather new knowledge,” and “gather new experiences” were identified as strong motivators for research engagement. Barriers to engagement included “workload,” “lack of time,” “school bureaucracy,” and “family life” (Šorgo & Heric, 2020, p. 77).

## **Results Interpreted with the Existing Scholarly literature**

### ***MNRI® Core Specialists' Sociodemographic and Professional Characteristics***

This study sample of MNRI® Core Specialists consisted of a majority of female ( $n = 93$ , 91.2%), White or Caucasian ( $n = 80$ , 78.4%), occupational therapists ( $n = 29$ , 28.4%), physical therapists ( $n = 17$ , 16.7%), and educators ( $n = 20$ , 19.6%), in private practice ( $n = 73$ , 71.6%). The majority of study participants had 1-5 years of experience as an MNRI® Core Specialists ( $n$

= 52, 51.0%). Most participants hold either a bachelor degree ( $n=41$ , 40.2%) or master's degree ( $n=51$ , 50.0%). There was a wide range of participant age and years in current profession. Age of participants widely varied, with most participants being 45-54 ( $n = 29$ , 28.4%) or 55-64 years ( $n = 32$ , 31.4%). Most participants reported 16+ years in current profession ( $n = 75$ , 73.4%).

Compared to related fields, the gender gap in this study, female ( $n = 93$ , 91.2%) and male ( $n = 4$ , 3.9%), is even more significant than in related allied health and education fields. For example, according to The National Center for Education Statistics (NCES), between 2017 and 2018, 76% of public elementary and secondary school educators were female (National Center for Education Statistics [NCES], 2021). Similarly, 77.5% of occupational therapists, 59.6% of physical therapists, and 80.2% of speech and language pathologists are female (Zippia, 2022a, Zippia 2022b, Zippia, 2022c).

The percentage distribution by race/ethnicity for the participants in this study was similar to related allied health professions and education. 78.4% of the study sample identified as White/Caucasian. The National Center for Education for 2017-2018 indicates that 79% of public elementary and secondary school educators as White/Caucasian (NCES, 2021). Similarly, 78.8% of occupational therapists, 73.9% of physical therapists, and 82.8% of speech and language pathologists identify as White/Caucasian (Zippia, 2022a, Zippia 2022b, Zippia, 2022c).

Study participants largely held either a bachelor degree ( $n=41$ , 40.2%) or master's degree ( $n=51$ , 50.0%). The percentage of public-school teachers between 2017 and 2018 that held a postbaccalaureate degree was 58% (NCES, 2021). With time, educational programs have evolved as requirements to enter the field have evolved. At this time, both occupational therapy and speech-language pathology require an entry-level master's degree. However, clinicians with a bachelor's degree before changes in educational standards may still have a bachelor's degree.

Currently, estimations indicate 55% of occupational therapists hold a bachelor's degree, and 37% hold a master's degree (Zippia, 2022a). The most frequent degree for the speech-language pathologist is a bachelor's degree, 62%, and a master's degree, 31% (Zippia, 2022c). A bachelor's degree is the most common degree for physical therapists, 58% (Zippia, 2022b), followed by a doctorate degree, 17%, and a master's degree, 17%. The Commission on Accreditation Physical Therapy Education made the Doctorate of Physical Therapy the required degree for all entry-level programs in 2016 (American Physical Therapy Association [APTA], 2022).

The majority of the study participants worked in private practice ( $n = 73$ , 71.6%). According to the U. S. Bureau of Labor Statistics, 29% of occupational therapists work in hospitals, and 25% work in private offices (U.S. Bureau of Labor Statistics, 2021a). The majority of physical therapists, 32%, work in private offices, and 28% work in hospitals (U.S. Bureau of Labor Statistics, 2021b). For speech-language pathologists, 38% work in educational services and 22% in private offices (U.S. Bureau of Labor Statistics, 2021c). Educators overwhelmingly work in public and private schools (U.S. Bureau of Labor Statistics, 2021d; U.S. Bureau of Labor Statistics, 2021e; U.S. Bureau of Labor Statistics, 2021f). The educators in the study sample were more likely to work in a private practice setting, such as an educational consultant or tutor, than actively practicing in a school setting.

The age of participants in this study also widely varied, with most participants being 45-54 ( $n = 29$ , 28.4%) or 55-64 years ( $n = 32$ , 31.4%). The average age of occupational, physical, and speech-language pathologists is 40, 41, and 39, respectively (Zippia, 2022a, Zippia, 2022b; Zippia, 2022c). Similarly, according to the National Center for Educational Statistics, the average age of public-school teachers is 42.4 (National Center for Educational Statistics, 2022). Most

MNRI® Core Specialists were slightly older than the average from OT, PT, SLP and education, although age ranges varied widely with some 65+ ( $n = 14$ , 13.6%).

In this study, 3.9% of the sample identified as academic clinical researchers. The literature suggests that non-research participants make up the largest group of health professionals (Farmer & Weston, 2002). The study findings are consistent with allied health professionals.

### ***Research Knowledge***

Research knowledge refers to the foundational understanding and comprehension of research methodology. This study measured research knowledge using an objective measurement consisting of 50 multiple-choice items. The literature acknowledges various taxonomies of knowledge (Krathwhol, 2002). Research knowledge, in this study, is declarative, explicit, and factual (Becerra-Fernandez et al., 2014, p. 19, Krathwhol, 2002, p. 214). Explicit knowledge is "knowledge that can be consciously recalled and stated, such as facts and events. It requires attention, awareness, and reflection" (Jenson & Mostrom, 2013, p. 234). Declarative knowledge is the "storage of facts and events" (ten Berge & van Hezewijk, 1999, p. 608). Finally, factual knowledge is "basic elements that students must know to be acquainted with a discipline or solve problems in it" (Krathwhol, 2002, p. 214).

Guided by the original Bloom's Taxonomy, research knowledge in this study was measured at the level of "knowledge." The Original Bloom's Taxonomy defined this level as knowledge of terminology and specific facts (Krathwohl, 2002, p. 2014). In the revised cognitive domain of Bloom's taxonomy, as described by Krathwhol (2002), this study measured research knowledge in the category of remembering (p. 214). Remembering involves retrieving facts and information from long-term memory (Krathwohl, 2002).

The results of this study indicate a low level of research knowledge. To put this finding into context, sixty-eight percent of the sample population identified as a *non-participant in research*, meaning they have no research experience. Additionally, only 55.9% of the sample population reported having a master's degree or higher. Although bachelor programs develop skills needed to be a research consumer, research skills are more common in programs offering a master's or higher degree. Most participants, graduated more than 10 years ago, 11-15 years ( $n = 8$ , 7.8%), 16-20 ( $n = 18$ , 17.6%), 21-25 years ( $n = 20$ , 19.6%), 26-30 years ( $n = 18$ , 17.6%), and 31+ years ( $n = 19$ , 18.6%). Therefore, it has been more than 10+ years since receiving formalized research training for  $n = 83$ , 81.4% of the study sample. Finally, participant responses to the open-ended questions revealed that participants identified as clinicians, not researchers. Therefore, participants have sought advanced clinical training but have not received ongoing research training.

The study's findings are similar to the existing scholarly literature. Research knowledge is frequently reported as part of research capacity or competence in the literature. Research capacity includes both research knowledge and research skill. Occupational therapists, physical therapists, and speech-language pathologists frequently report low to moderate research capacity in the literature reviewed here. For example, the research knowledge score among pediatric occupational therapists from Taiwan, Australia, and the United Kingdom, was moderate using the KAP scale (Brown et al., 2009). Among allied health professionals, barriers to research engagement have included research knowledge & skills (Pager et al., 2012; Borkowski et al., 2016).

These professions tend to be more comfortable with evidence-based practice on the research continuum, using research to inform clinical practice. Competence in scholarship, or

participation in research, is less common (Pighills et al., 2013; Karlsson & Törnquist, 2007). It is important to note that the literature regarding research knowledge in the related fields reviewed here has become less frequent as educational standards and entry-level degree requirements have evolved.

### ***Research Attitude***

Research attitude, in this study, is defined as a self-reported view of research, which includes overall attitude, perception of the usefulness of research, and positive/negative feelings toward research (Papanastasiou, 2005; Papanastasiou, 2014). An average of 30 Likert-type items was used to measure research attitude in this study. The participants were generally agreeable with research. This finding is consistent with the literature examined from the related allied health professions. Occupational therapists, speech-language pathologists, and physical therapists believe research is important for professional practice and have an overall positive attitude toward research (Brown et al., 2010; Janssen et al., 2016; & Stephens & Upton, 2012; Zipoli & Kennedy, 2005). For example, Eller et al. (2003) reported high research attitude scores for both non-nurses and allied health professionals ( $n = 2226$ ) using the Nurses' Research KAP Survey (Research KAP Survey) (Eller et al., 2003). Brown et al. (2010) reported similar results in a cross-cultural survey. In this study, the overall research attitude scores for pediatric OTs ( $n = 1230$ ) in Australia, The United Kingdom, and Taiwan was moderate. Although the overall scores were moderate for research knowledge, research attitude, and research practice, research attitude scores were the highest among the three domains in this study. Similar to allied health professionals, teachers also express a generally positive attitude toward research-informed teaching and research engagement. For example, nursery, primary, and secondary teachers

surveyed from Scotland, Wales, and England ( $n = 390$ ) indicated a generally positive attitude toward applying research in the classroom (Williams & Coles, 2007)

This study used *The Attitude Toward Research Scale*© (ATR-S) to measure research attitude. As indicated in the study's conceptual framework, *research self-efficacy* and *research motivation* are attributes of research attitude. However, at face value, the instrument used to explore research attitude did not include research self-efficacy and research motivation. Therefore, two additional questions were added to the study survey questions to supplement the information regarding research attitude.

### **Research Self-Efficacy.**

In this study, research self-efficacy is the self-reported confidence in one's research ability (Lambie et al., 2014b). One Likert-type question was included in the study questionnaire to measure research self-efficacy. Participants in this study indicated that they were not at all confident ( $n = 31$ , 30.4%), not so confident ( $n = 29$ , 28.4%), or somewhat confident ( $n = 32$ , 31.4%) in their ability to conduct research. This finding was consistent with the literature. Confidence has been identified as a barrier to evidence-based practice (Barrimore et al., 2020; Garcia et al., 2021) and research engagement (Borkowski et al., 2016). Barrimore et al. (2020) explored allied health professionals' ( $n = 374$ ) efficacy in translating research into practice. Although study participants reported awareness and interest in knowledge translation, they reported low research confidence for translating research findings into practice.

Confidence in applying evidence in practice was also a challenge identified among Chilean occupational therapists ( $n = 192$ ). Study participants "did not feel confident finding, appraising, or integrating research evidence into practice" (Garcia et al., 2021, p. 169).

Nevertheless, most participants (74.5%) indicated training in evidence-based practice would be “useful” or “very useful” (p. 174).

Similar results have been found regarding conducting research. For example, Decullier et al. (2021) explored "representations of research" of newly graduated paramedical professionals from France (p.1). The paramedical professionals included speech therapy, occupational therapy, and physiotherapy, among other professionals. Using a free word association questionnaire and interviews, study participants reported interest in evidence-based practice but less confidence and motivation "to generate evidence themselves" (p.1).

Research efficacy has also been identified as a barrier to research engagement. For example, Australian allied health professionals identified a “perceived lack of self-efficacy in research,” “lack of confidence in statistical analysis,” and “lack of confidence in presenting research” as barriers to research participation (Wenke et al., 2020, p. 4). Similarly, a lack of confidence in research skills was identified as a barrier to research engagement for Australian allied health professionals (Borkowski et al., 2016, p. 301).

The educational literature has also identified a lack of confidence across the research continuum. For example, Martinovic et al. (2012) explored research among K-12 teachers ( $n = 547$ ). Although participants were generally interested and confident with using research in practice (p. 392), they reported being the least confident "about being well trained to conduct educational research" (p. 391).

### **Research Motivation.**

Research motivation is the willingness to engage in research in this study. Participants in this study indicated that they were not so motivated ( $n = 30$ , 29.4%) or somewhat motivated ( $n = 41$ , 10.2%) to conduct research. Research motivation has been examined in the allied health

literature. For example, low research motivation was a barrier to research engagement in a qualitative study among allied health professionals from a public hospital in Australia ( $n = 21$ ) (Wenke et al., 2020).

Newly graduated paramedical professionals in France reported similar findings. Paramedical professionals included speech therapists, occupational therapists, and physiotherapists among a larger group of paramedical professionals. In this qualitative study, participants reported low motivation to generate research evidence (Decullier et al., 2021).

Motivators for research engagement have also been reported. Examples of research motivators have included both intrinsic and extrinsic factors. For example, allied health professionals in Australia identified nine research motivators ( $n = 21$ ). Research motivators included “social influences,” such as “positive influences and support within research team,” “beliefs about consequences,” such as “research informs practice and patient care,” “goals/motivation,” such as “to develop specific research skills as clinician or future research higher degrees,” “skills,” such as “having previous skills, training or experience,” “knowledge” such as “knowledge in EBP, participation or leading research,” “environmental context,” such as “financial and physical resources made available to engage,” “behavior regulation,” such as “step-by-step engagement and planning,” “social professional role” such as, “research part of professional identity or work role,” “emotions” such as, “general enthusiasm and passion for research activity,” and “optimism” such as, “confident will achieve outcomes” (Wenke et al., 2020, p. 4).

Crombie et al. (2021) explored an Australian regional allied health professional group ( $n = 80$ ). Using the Research Capacity and Culture tool, the researchers examined several research

motivators. Study participants identified "develop skills" and "identifying a problem that needed to be changed" as the two most significant research motivators (p. 399).

### ***Research Practice***

Research practice, in this study, is defined as the self-reported active participation in individual or collaborative scientific investigations. An average of 10 Likert-type items was used to measure research practice. Analysis of participant response to the *Wessex Research Network Spider*© indicated that participants collectively had little research experience. This finding was supported by the study's survey demographic question asking participants to identify their level of research experience as a non-participant, participant (member of a research team), clinical researcher (manage own research), and academic (experienced researcher). Participant responses indicated non participants ( $n = 68$ , 66.7%), participant member ( $n = 23$ , 22.5%), clinical researcher ( $n = 7$ , 6.9%), and academic ( $n = 4$ , 3.9%). This finding is similar to findings identified in the allied health literature evaluated here. The allied health professional literature reviewed for this study signaled that research capacity and engagement are underdeveloped (Wright et al., 2020; Taylor et al., 2019).

Pediatric occupational therapists from Taiwan, Australia, and the United Kingdom reported moderate research practice scores (Brown et al., 2009, p. 38). Although all three domains were scored as "moderate," the lowest score was for research practice (p. 42). Researchers used the Research Knowledge, Attitudes and Practices Survey (Research KAP Survey) in this study.

Eller et al. (2003) also utilized the Research KAP Survey to examine nurses ( $n = 538$ ) and non-nurse allied health professionals ( $n = 1688$ ). Study participants in the non-nurse group scored higher for research tasks found at the beginning of the research continuum. For example,

high research practice scores were reported for “identifying clinical problems, identifying information from the literature and participating in the design of intervention” (p. 167).

In 2019, Taylor et al. examined research interest and experience among allied health professionals ( $n = 245$ ) in Australia following the implementation of an allied health clinical research office. Using the *Research Spider*©, study participants, which included Australian allied health professionals ( $n = 245$ ), reported some interest and low research experience using the *Research Spider*©. Ots, STs and PTs were among the allied health professionals surveyed (Taylor et al., 2019).

Despite a general agreement that educational research influences educational practices and improves student outcomes, academic research is also reportedly underutilized by teachers (Cain, 2016). In addition, teacher engagement in research remains low even among teacher educators (Borg & Alshumaimeri, 2012). Borg & Alshumaimeri (2012) explored teacher educators' ( $n = 82$ ) engagement in research in Saudi Arabia. “In terms of doing educational research, 18.3% of respondents said they never did it, 13.4% said they did it rarely, 26.8% occasionally, and 41.5% regularly” (p. 350).

### ***The Relationship Between Educational Degree and Research Knowledge, Attitude, and Practice***

The relationship between educational degree and research knowledge, attitude, and practice emerged as a theme from the analysis of the related literature. This study found no association between *educational degree-research knowledge* and *educational degree-research attitude*. However, a relationship was identified between *educational degree-research practice*. This finding is in partial agreement with the literature.

Jette et al. (2003) explored physical therapists' ( $n = 488$ ) "beliefs, attitudes, knowledge and behaviors" to evidence-based practice (EBP) (p. 786). EBP was associated with education level and years of experience in this study. "Respondents' reports of their education, knowledge, and skills related to EBP were generally associated with age, years since licensure, and both professional (entry-level) and advanced academic degrees" (p. 792). In this study, younger therapists with fewer years of experience tended to have more training, knowledge, and skills related to EBP (p. 786).

#### *Educational Degree-Research Knowledge*

Eller et al. (2003) explored research knowledge, attitude, and practice in a nurse and non-nurse allied health professional group. Using the Nurses Research KAP Survey (Research KAP Survey), no relationship between educational degree and research knowledge was identified in the non-nurse, allied health professionals ( $n = 1688$ ). Degrees included associates, bachelors, masters, and doctorates (Eller et al., 2003). Education was related to research knowledge in the non-nurse group (Eller et al., 2003). Significant differences ( $F = 20.9$ ;  $df = 2419$ ;  $p < .000$ ) by level of education was also noted for research knowledge in the non-nurse group.

#### *Educational Degree- Research Attitude*

In the same study by Eller et al. (2003), no relationships between education and research attitude were identified for either the non-nurse, allied health professional group, or the nurse group (Eller et al., 2003). Significant differences ( $F = 5.5$ ;  $df = 2400$ ;  $p < .004$ ) by level of education was noted for research attitude in the nurse group ( $n = 538$ ) (Eller et al., 2003).

Academic degree did not correlate with research attitudes in occupational therapists from Sweden (Karlsson & Törnquist, 2007). "Ots with additional university studies did not demonstrate a more positive attitude towards, or feel more able to perform, research activities"

(p. 228). Research activities in this study included reading research, encouraging colleagues to read, applying research findings, and initiating research.

#### *Educational Degree- Research Practice*

Eller et al. (2003) also explored the relationships between educational degree and research practice. In this study, there were no relationships between education and research practice for non-nurse, allied health professionals (Eller et al., 2003). Education was related to research practices in the nurse group (Eller et al., 2003). In the nurse group, significant differences ( $F = 5.8$ ;  $df = 2385$ ;  $p < .003$ ) by level of education was also noted for research practices ( $n = 538$ ) (Eller et al., 2003). Similarly, Waive et al. (1997) also identified an association between level of education and research practice among occupational therapists in Alberta, Canada.

The educational literature has identified a relationship between educational degree and research engagement. For example, among Israeli teacher educators, study participants with a Ph.D. were more productive than those without (Nasser-Abu Alhija & Majdob, 2017). Similarly, academic economics across eight universities were more likely to engage in research if their highest educational degree was a Ph.D. (Fox & Milbourn, 1999).

#### ***The Relationship Between Years of Professional Practice and Research Knowledge, Attitude, And Practice***

Years of professional practice and research knowledge, attitude, and practice also emerged as a theme in the supplementary literature review for this study. There was no relationship between years of professional practice and research knowledge, attitude, and practice for the participants in this study. This finding was in partial agreement with the

established literature. Chronological age has been used in the literature as a comparable characteristic to years of professional experience.

Physical therapists' ( $n = 488$ ) beliefs, attitudes, knowledge, and behaviors toward evidence-based practice education have been associated with educational level and years of experience (Jette et al., 2003). "Respondents' reports of their education, knowledge, and skills related to EBP were generally associated with age, years since licensure, and both professional (entry-level) and advanced academic degrees" (p. 792). All participants in this study were members of the American Physical Therapy Association. "Respondents who had less than 5 years since licensure were 4.6 times more likely to agree that EBP is necessary and 2.6 times more likely to agree that EBP improves the quality of patient care than respondents with more than 15 years since licensure" (p. 791). This finding indicates an association between years of professional experience and research attitude toward evidence-based practice.

#### *Years of Professional Experience – Research Knowledge*

The educational literature, specifically the teacher educator literature, has identified varied relationships between years of professional experience and research productivity. For example, in a study by Kwiek (2018), older teachers increased research engagement and research productivity. However, research productivity has also been high during middle age (Baldwin et al., 2005, Jung, 2014).

#### *Years of Professional Experience – Research Attitude*

Williams and Coles (2007) conducted a mixed-methods study to explore "teachers' approaches to finding and using research evidence" (p. 185). In this study, teachers in the United Kingdom had a positive attitude toward research. In addition, younger teachers between the ages of 20 and 30 tended to "be more positive about research" (p. 192).

### *Years of Professional Experience – Research Practice*

Trusson et al. (2019) explored the “challenges and benefits of clinical academic careers for nurses, midwives and allied health professionals” ( $n = 67$ ) in the East Midlands region of England (p. 1). Using a mixed-methods design, study participants indicated a “relatively late age of NMAHPs embarking on the clinical academic pathway” (Trusson et al., 2019, p. 7).

Qualitative analysis revealed that most nurses, midwives, and allied health professionals in this study did not pursue advanced doctoral degrees and subsequently didn’t engage in research until later in their careers when they achieved senior clinical posts (Trusson et al., 2019).

### ***The Relationship Between Research Knowledge, Research Attitude, and Research Practice***

This study aimed to develop a baseline understanding of MNRI® research knowledge, attitude, and practice. The KAPM model was chosen as the study's theoretical perspective, and the research knowledge, attitude, and practice model, as the study's conceptual framework. In this model, a linear relationship exists between knowledge, attitude, and practice, although the ordering of each domain can vary. Although theory testing was not the intention of the research study, it is important to understand the relationship between the domains in the conceptual model. Three spearman correlations were conducted to explore the relationship between research knowledge, attitude, and practice. Analysis revealed a significant correlation between each domain pairing: *Research Knowledge-Research Attitude*, *Research Knowledge-Research Practice*, and *Research Attitude-Research Practice*. The achieved power for the significant correlations between *Research Knowledge -Research Attitude* and *Research Attitude-Research Practice* exceeded .88. The power analysis for *Research Knowledge - Research Practice* fell below .88.

The overall patterns of this study's findings were similar to results in the literature. For example, Eller et al. (2003) found a significant correlation between research knowledge-research attitude, research knowledge-research practice, and research attitude-research practice in nurses and allied health professionals ( $n = 2226$ ) using the Research KAP Survey (KAP Survey).

The teacher educator literature has also reported a relationship between research knowledge and research practice. For example, Nasser-Abu Alhija & Majdob (2011) explored the relationships between research productivity and professional and personal characteristics among teacher educators in Israel ( $n = 161$ ). In this study, researchers identified five predictors of research productivity. These included “academic rank,” “rank,” “administrative position,” “desire to develop new knowledge and learn from research findings,” and “perceived insufficient research competence and self-confidence” (p. 34).

The educational literature has identified a relationship between research attitude and practice. For example, Williams & Coles (2007) conducted a mixed-methods study to explore “teachers' approaches to finding and using research evidence” (p. 185). In this study, teachers in the United Kingdom had a positive attitude toward research. Furthermore, teachers' attitude toward research was associated with research experience ( $p < 0.001$ ). “Teachers currently taking part in research-based study tending to be more positive about research” (p. 192).

### ***Barriers And Facilitating Factors to Conducting Research in The Masgutova Method®***

This study identified barriers and facilitators to research on multiple levels: individual, methodological, organization, the medical community, and emotional. Overall, the barriers and facilitators identified agreed with those identified in the literature among related health professionals. The literature reviewed identified barriers and facilitators to both EBP and research engagement.

### **Individual Factors.**

Individual factors to evidence-based practice and research engagement were frequently identified in the related literature reviewed here as both barriers and facilitators. For example, research capacity, including research knowledge skills, and research self-efficacy, or confidence, was frequently identified by study participants as an individual factor. This finding was also commonly reported in the literature (Trusson et al., 2019; Eller et al., 2003; Garcia et al., 2021; Cordrey et al., 2022; Wenke et al., 2020; Pager et al., 2012; Borkowski et al., 2016; Alison et al., 2017).

The impact of roles, specifically clinician verse researcher, was also expressed as a barrier to research by study participants. This finding is also congruent with the related literature reviewed. For example, "straddling between two roles" was identified as a barrier to research participation by Australian allied health professionals (Wenke et al., 2020, p. 4). Similarly, in a study by Crombie et al. (2021), "other work roles take priority" and "lack of time" was identified as a barrier to the research capacity of a regional allied health workforce (p. 4).

### **Study Methodological Factors Impacting Research in The Masgutova Method®.**

In this study, participants identified various factors related to the study methodology as barriers and facilitating research factors. Study participants frequently identified research resources as influencing research in The Masgutova Method®. Time and money were among the most frequently identified factors. This finding is consistent with the literature (Cordrey et al., 2022; Wenke et al., 2020, Pager et al., 2012; Borkowski et al., 2016). For example, Wenke et al. (2020) explored factors influencing allied health professionals' participation in research. Research resources such as time, funding, and physical resources were identified as necessary for research participation (Wenke et al., 2020, p. 4).

### **Organizational Factors.**

Study participants also identified factors related to the organization as influencing research in The Masgutova Method®. This finding agrees with the literature reviewed from the related health professions. Organizational factors were identified in both qualitative studies and studies using tools examining research culture, such as The Research Capacity and Culture Tool (Alison et al., 2017; Cordrey et al., 2022; Garcia et al., 2021; Pager et al., 2012; Borkowski et al., 2016). For example, research culture was identified as a barrier to evidence-based practice among Chilean occupational therapists (Garcia et al., 2021).

Organizational support was identified as a barrier to research among allied health professionals in Australia (Pager et al., 2012). Alison et al. (2017) explored factors influencing allied health professional research engagement in Australia ( $n = 276$ ). In this study, infrastructure for research which included funding and equipment, and research culture, such as organizational support for research, emerged as important factors on an organizational level (p. 277). Comparably, allied health professionals in the United Kingdom identified “administrative support” as a barrier to research (Cordrey et al., 2022, p. 5).

### **Recognition in the Medical Community: Range of Evidence.**

The Masgutova Method® is a research emergent intervention. At this time, it is not fully recognized in the medical community as being evidence-based. The related literature reviewed for this study does acknowledge the importance of evidence-based practice (Garcia et al., 2021; Pighills et al., 2013; Zipoli & Kennedy, 2005). However, the literature is directed toward achieving the best patient/client care when speaking to evidence-based practice. Since the related literature reviewed is from already established professions, the literature reviewed did not discuss seeking recognition as a barrier or facilitating factor to research.

## **Emotion.**

In this study, emotion emerged as a factor influencing research in The Masgutova Method®. Study participants reported frustration and hope. The related literature reviewed for this study also identified emotions as barriers and facilitators to research. These have included fear, feeling nervous, and excitement. For example, allied health professionals in the United Kingdom identified “fear of getting it wrong” as a barrier to research engagement (Cordrey et al., 2022, p. 5). Wenke et al. (2020) explored influences on research participation among allied health professionals in Australia. In this group, "feeling overwhelmed or nervousness or intimidation in undertaking research" and "fear of getting it wrong" were examples of emotions identified as barriers to research (p. 5). In the same study, enablers to research participation were identified as “excitement to impact patient care,” and “general enthusiasm and passion for research activity” (Wenke et al., 2020, p. 4).

## **Preliminary Thematic Analysis**

Two preliminary themes emerged from this analysis. Other components are not noted here but will continue to be analyzed. The first theme is *barrier and facilitating factors to research are two sides of the same coin*. The second theme is *time and money significantly impact research in The Masgutova Method®*.

### ***Barriers & Facilitators to Research are Two Sides of the Same Coin***

Analysis of participant responses reveals that *barrier and facilitating factors to research in are two sides of the same coin*. This finding is consistent with the literature reviewed from the related health fields that also identified barriers and facilitators to research as being the same. For example, Wenke et al. (2020) describe influences on allied health clinicians' participation in

research within the public health setting. In this qualitative study, several factors were described as enablers and barriers. For example, "clinicians describe[d] their emotional response to research as enablers and barriers to participating or leading research" (Wenke et al., 2020, p. 6). Similarly, previous training was identified as an enabler and lack or insufficient training as a barrier. Study participants identified lack of time and funding for research as a barrier and funding and dedicated time as an enabler (p.7).

***Time & Money Play a Significant Role in Research in The Masgutova Method®***

Participants in this study identified time and money as the two most significant barriers to research in The Masgutova Method®. Time and money are commonly identified in the related literature reviewed for this study as barriers to evidence-based practice and research engagement (Pager et al., 2012; Borkowski et al., 2016). For example, time and funding pressures were the two most frequently mentioned barriers to participation by Australian allied health professionals ( $n = 21$ ) (Wenke et al., 2020, p. 4). Similarly, a qualitative study exploring research capacity building in Australia identified a "lack of time and financial resources as the most significant barriers to research capacity building in allied health" (p. 7), as identified by senior managers (Golenko et al., 2012).

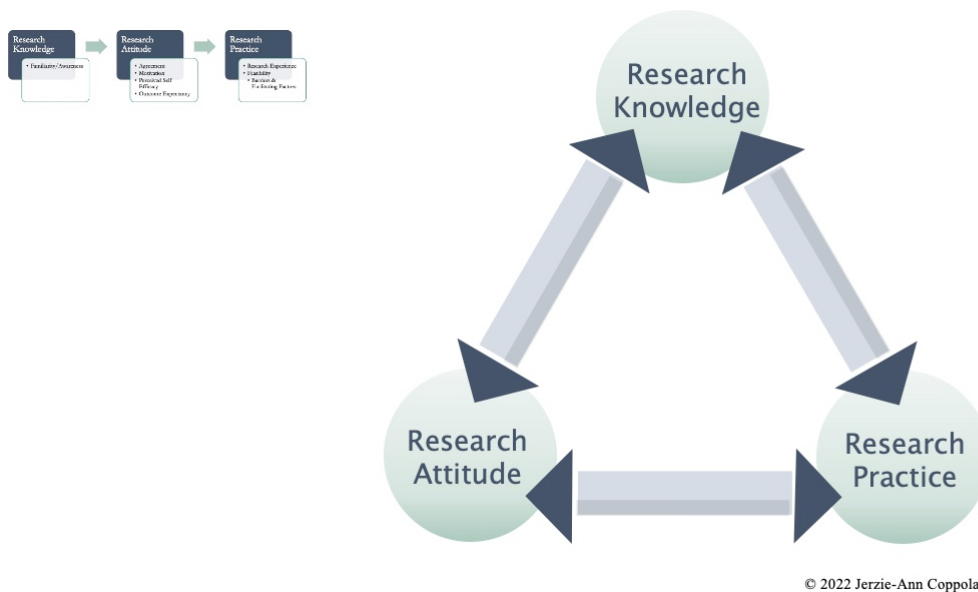
Although some studies have identified time and money as the two most significant barriers to research, some have identified either time or money alone as the most important factor influencing research engagement. For example, Greenspoon et al. (2014) identified time as the most significant barrier to research among occupational therapists and occupational therapy assistants surveyed in a Canadian academic health care system. Similarly, among teacher educators in Saudi Arabia. The most frequent reason for not doing research was "I do not have time to do research of any kind" (Borg & Alshumaimeri, 2012, p. 351).

### Alternative Model of the Study's Conceptual Framework: Research Knowledge-Attitude-Practice

As previously discussed, the analysis of RQ9 revealed an inter-relationship between the domains: *Research Knowledge-Research Practice*, *Research Knowledge-Research Attitude*, and *Research Attitude-Research Practice*. An alternative model of the inter-relationship between the domains is presented in **Figure 32**.

**Figure 32**

*Conceptualized Interrelationship Between Domains*

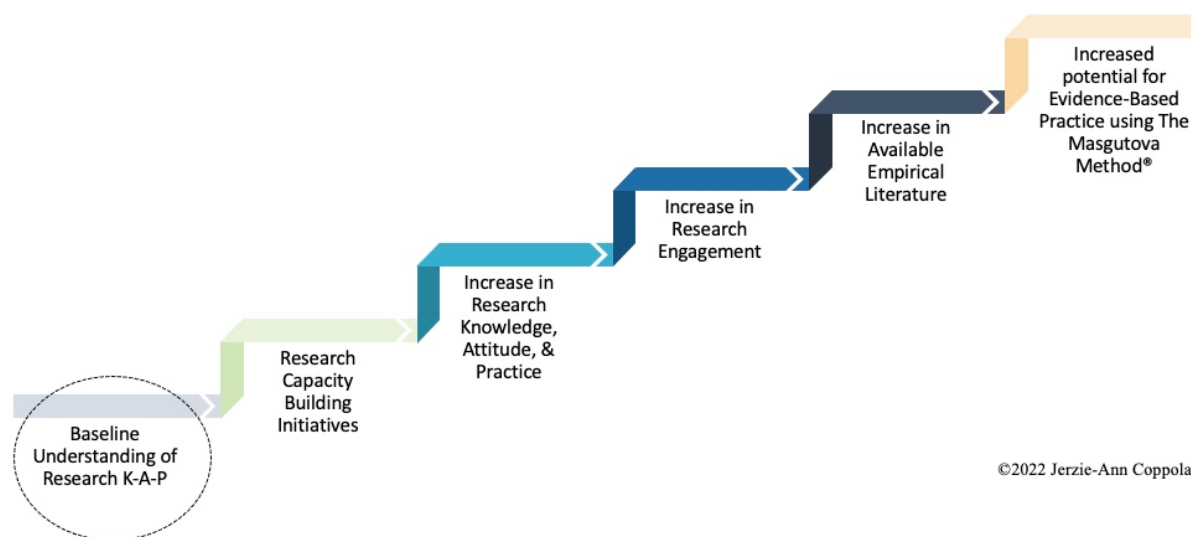


In this model, *Research Knowledge* has a bi-directional relationship with research attitude and practice. At the same time, *Research Attitude* has a bi-directional relationship with *Research Practice*. Although a linear hierarchical relationship between knowledge, attitude, and practice is frequently discussed in the literature (Roelens et al., 2006; Muleme et al., 2017), variations have

also been considered, including a bi-directional inter-relationship as presented above (Azizi et al., 2011). For example, Schwartz examined different KAP models when describing Canadian public health nurses' nutrition knowledge, attitudes, and practices (Schwartz, 1976). This deviation from the learning cognitive hierarchical progression of *Research Knowledge*, *Research Attitude*, and *Research Practice* (Valente et al., 1998) may serve as a potential conceptual framework for future research studies.

### **Practical Implications: Roadmap to Translate Findings into Action**

The baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice can inform future research capacity-building programs to facilitate research competence. In addition, a successful research capacity-building program can promote research engagement, expand the available empirical literature on The Masgutova Method®, and ultimately increase the potential for evidence-based practice by practitioners when using The Masgutova Method®. **Figure 33** visually conceptualizes the position of this research as the starting point for future research engagement initiatives.

**Figure 33***Practical Implications*

The Masgutova Graduate School of Neurodevelopmental Sciences opening in 2021 marked the first significant initiative toward building professionals with specific training in The Masgutova Method® and research. In addition, The Masgutova Foundation®, initially established in 2014, was relaunched in 2020. One of the strategic goals of The Masgutova Foundation® is to "advance interdisciplinary scientific knowledge in NeuroReflex Integration, Neurodevelopment, and Neuromodulation" (Masgutova Foundation, 2022, para. 2). In 2021, The Masgutova Foundation® surveyed stakeholders to identify research priorities.

The research capacity-building recommendations presented here consider the study's findings and the most current research initiatives in The Masgutova Method®, as described above. Research capacity "refers to the ability to produce research" (Frakking et al., 2021, p. 2756). Research capacity building is "a process of individual and institutional development that

leads to higher levels of skills and greater ability to perform useful research" (Trostle, 1992, p. 1321). The goals of research capacity-building programs include: improve research knowledge, attitude, and practice, increase research volume, influencing health care practice and policy, and improving clients' health and function (Webster et al., 2011, p. 107).

Cooke (2005) published "Research Capacity Building: A Framework for Evaluation" (p. 3). The framework included six research capacity-building principles across four ecological levels (Individuals, Teams, Care Giving Organizations, and Networks & Support Units) (p. 3). The six principles of capacity building include: "building skills and confidence, developing linkages and partnerships, ensuring the research is 'close to practice,' developing appropriate dissemination, investments in infrastructure, and building elements of sustainability and continuity" (Cooke, 2005, p. 3).

A multi-layered, multi-leveled focused strategy is recommended to build MRNI® Core Specialists' research capacity. The primary goal of these initiatives is to increase the *research motivated* MNRI® Core Specialists' ability to "design, conduct, and communicate a research study" (Davidson & Palermo, 2015, p. 2). Practice recommendations include the following:

- Develop a research action plan that reflects stakeholder priorities
- Enhance current case study guidelines & increase research support for planning, approval, and execution of case study research.
- Develop a research mentorship program
- Build MNRI® Core Specialists' research capacity through Participatory Action Research and Intervention Research
- Develop a small research capacity building program for the *research motivated* MNRI® Core Specialists

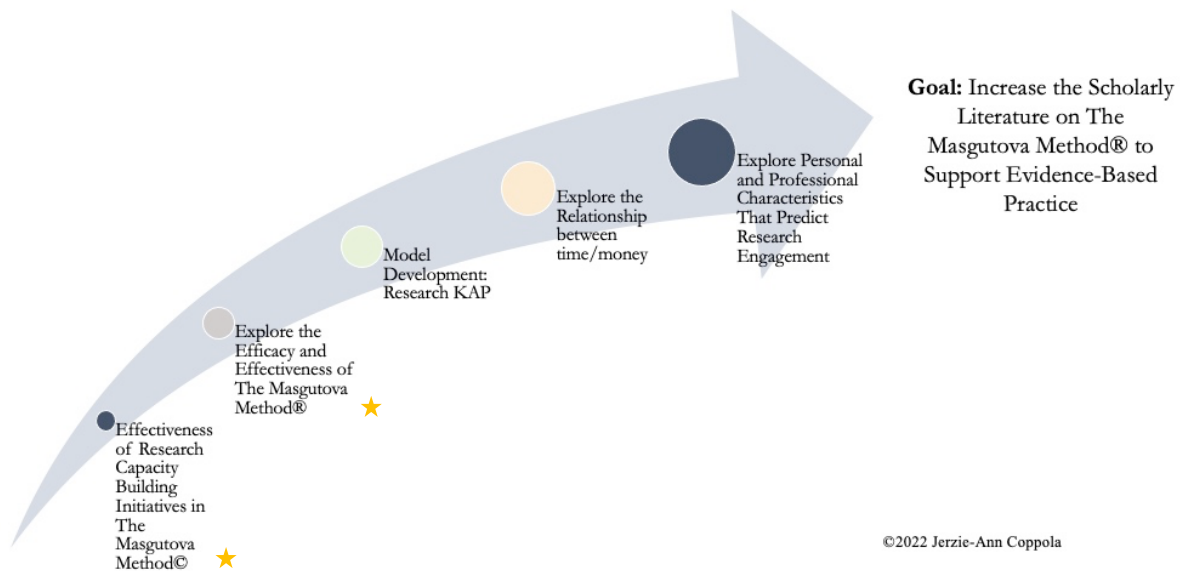
- Increase Organizational Support for Research Design & Planning
- Reduce barriers (i.e., funding, time, and other research resources)
- Build collaborative partnerships with neuroscientists and research universities
- Continue to foster a positive research culture within the organization

### **Future Research**

The most significant contribution of this research study is to inform future organizational strategies to enhance MNRI® Core Specialists' research competence through research capacity-building initiatives as described above. Future research recommendations include:

- Effectiveness of future research capacity-building programs/initiatives
- Examine the effectiveness and efficacy of The Masgutova Method® across diagnosis and age groups
- Model Development: Non-linear relationship of research knowledge-attitude-practice
- Explore the relationship between time and Money as barrier/facilitating factors
- Explore personal and professional characteristics that predict research engagement

**Figure 34** visually represents suggested directions for future research.

**Figure 34***Directions for Future Research*

Additionally, sample selection bias occurs when "extraneous sampling factors that affect survey results produce systematic bias and reduce the validity of the data" (Alreck & Settle, 2004, p. 80). Alreck & Settle (2004) highlight common sample selection limitations used when identifying sources of bias for this research study. For example, this study relied on internet access; therefore, accessibility bias may exist. This study included only individuals with access to the internet. When accessibility bias is present, "some respondents are more readily selected or included in the sample, so they're over-selected" (p. 81). Other potential biases included non-response bias and self-selection bias (p. 81). Non-response bias occurs because "respondents of a

certain type" are more likely to refuse to participate, leading to underrepresentation (p. 81).

Additionally, since the survey was voluntary, self-selection bias may also exist because "those of a certain type" tend to participate in the study, leading to over-representation of that group (p. 81). Finally, some individuals may be more likely to terminate or withdraw their participation in a study, leading to underrepresentation and contributing to termination bias.

Other limitations included the exclusion of individuals that are not proficient in English. The Masgutova Method® identifies as an international organization. Although it originated in Russia, there are two current headquarters: the United States and Poland. Participants from 11 different countries responded to the study survey. Some of the most experienced MNRI® Core Specialists, including the authors of peer-reviewed journal articles on The Masgutova Method®, may not describe themselves as proficient in reading and writing English; therefore, they would not be captured in this study.

Differences between countries of practice were not explored and may influence findings. Although The Masgutova Method® training is consistent, professional research training and international guidelines and expectations surrounding research may vary between countries. Participant responses to open-ended questions reflected these differences. For example, participant #15 (ID 21), a United States-based participant, identified "IRB approval" as a facilitator to research. The Institutional Review Board (IRB) is designated to review research according to the Food and Drug Administration to protect human subjects in the United States. Participant #32 (ID 50), who identified as an international specialist, stated: "The main problem with obtaining clinical trial permit is a long process of negotiating contracts."

Limitations in the available sampling frame and the study sample size also impacted the research study. Although having access to the sampling frame supports the authenticity of the

study findings, both the sampling frame and sample size were small. Larger sample sizes would have allowed for additional analysis to inform model development and other possibilities, such as exploratory factor analysis within this population. As the number of MNRI® Core Specialists grows, the ability to utilize more complex statistical analysis may expand. In addition, although 102 out of 151 is a strong response rate for a survey study, a larger sample size might have identified additional statistically significant correlations and, at a minimum, increased the power for RQ9b. RQ9b explored the relationship between research knowledge and research attitude. The Spearman correlation between Research Knowledge and Research Practice was statistically significant,  $r_s(102) = .22, p = .030$ ; however, it did not meet the adequate power for Spearman Correlation.

The data reported is self-reported, and therefore results from this study may not be generalizable. In addition, the study assumes the participant is being honest with their responses. Although the *Research Knowledge Assessment*© measured research knowledge with multiple-choice questions, the *Attitudes Toward Research Scale*© and *Wessex Research Network Spider*© used a Likert scale and are overall less objective and more dependent on self-perception and self-report.

Although the survey response rate was strong for survey-based social science research, the study did have a high attrition rate. Only 102 out of 150 opened surveys were fully completed meaning 32% of respondents who opened the survey did not finish. Seventeen participants failed to meet the inclusion criteria for either language proficiency or certification status, and an additional thirty-one participants failed to complete the survey in its entirety. Of the thirty-one participants that opened the survey, met the inclusion criteria, but did not complete the survey, most withdrew from the survey within the first 15 questions.

Additionally, this study is limited because it is not a traditional mixed-methods design. In a conventional mixed-methods study, all domains and constructs are analyzed quantitatively and qualitatively. However, only research practice was analyzed from both approaches in this study. More specifically, research experience was measured quantitatively, and feasibility was measured qualitatively. Therefore, direct integration of qualitative and quantitative results for research knowledge, research attitude, research motivation, and research self-efficacy was not possible. As is expected in a purely qualitative study, this study did not include member checks. Member checks help to ensure trustworthiness.

Finally, research motivation and research self-efficacy were measured using only a single Likert-type question. These two questions did not follow the procedures of a Delphi panel. Instead, these two questions aimed to supplement the research attitude assessment and provide a more global understanding of research attitude conceptualized in the KAPM and the study's conceptual framework.

## **Conclusion**

Given the limited literature exploring research in MNRI® Core specialists, this study established a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice. While MNRI® Core Specialists reported a favorable attitude toward research, they are less confident, motivated, and experienced performing research activities. Overall, the ability to conduct research is underdeveloped in MNRI® Core Specialists. As experienced clinicians, MNRI® Core Specialists have committed time and financial resources to become an MNRI® Core Specialist. As a result, they may be more likely to identify as clinicians, not researchers. This finding mirrors other professional groups. "Allied health professionals are integral to

research, yet rarely engage simultaneously in research and clinical practice" (Miller et al., 2020, p. 16).

The results of this study have implications for the development of research building initiatives. Directed and focused research capacity building, to build research competence and foster research engagement, is recommended to support the small group of specialists who aspire to be strong researchers of The Masgutova Method®. Over time, students graduating from The Masgutova Graduate School of Neurodevelopmental Sciences will grow to support research on a larger scale.

Participant responses indicated barrier and facilitating factors to research in The Masgutova Method®. Barrier and facilitating factors were identified on individual, methodological, organization, and community levels. Barriers need to be addressed on all levels to facilitate research in The Masgutova Method®.

The development of clinician-investigators can significantly improve clinical practice, foster acceptance within the medical community, and promote future collaborative partnerships. Through the expansion of research, The Masgutova Method® can gain professional credibility, broaden the scientific base, and ultimately improve client care so that practice reflects the currently available research evidence (Witzke et al., 2008).

Although the aim of the research study was never to develop a theory or test a model, the results of this study did suggest a non-linear relationship between each domain pairing: *Research Knowledge-Research Attitude*, *Research Knowledge-Research Practice*, and *Research Attitude-Research Practice*. Initially, the study's conceptual framework assumed a linear hierarchical relationship between knowledge, attitude, and practice. However, analysis of study participant responses suggests a bi-directional triad between each domain. This insight may provide a lens to

guide future research studies exploring research knowledge, research attitude, and research practice.

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## **Appendix A**

### **Seton Hall University Institutional Review Board Approval Letter**



June 25, 2021

Ms. Jerzie-Ann Coppola  
Seton Hall University

Re: 2021-207

Dear Ms. Coppola,

The Research Ethics Committee of the Seton Hall University Institutional Review Board reviewed and approved your research proposal entitled, "*Exploring Research Knowledge, Attitude, & Practice of MNRI® Core Specialists*" as resubmitted. This memo serves as official notice of the aforementioned study's approval as exempt. If your study has a consent form or letter of solicitation, they are included in this mailing for your use.

The Institutional Review Board approval of your research is valid for a one-year period from the date of this letter. During this time, any changes to the research protocol, informed consent form or study team must be reviewed and approved by the IRB prior to their implementation.

You will receive a communication from the Institutional Review Board at least 1 month prior to your expiration date requesting that you submit an Annual Progress Report to keep the study active, or a Final Review of Human Subjects Research form to close the study. In all future correspondence with the Institutional Review Board, please reference the ID# listed above.

Sincerely,

Mara C. Podvey, PhD, OTR  
Associate Professor  
Co-Chair, Institutional Review Board

Phyllis Hansell, EdD, RN, DNAP, FAAN  
Professor  
Co-Chair, Institutional Review Board

**Office of the Institutional Review Board**

Presidents Hall · 400 South Orange Avenue · South Orange, New Jersey 07079 · Tel: 973.275.4654 · Fax 973.275.2978 ·  
[www.shu.edu](http://www.shu.edu)

WHAT GREAT MINDS CAN DO

**Appendix B**  
**Institution Permissions**



SVETLANA MASGUTOVA EDUCATIONAL INSTITUTE®  
FOR NEURO-SENSORY-MOTOR AND REFLEX INTEGRATION, LLC

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July 8, 2020

Re: Authorization to Conduct Research

To Whom it may concern,

The purpose of this letter is to grant Jerzie-Ann Coppola (principle investigator) permission to conduct the dissertation study exploring MNRI Core Specialists' research knowledge, attitudes, and practices at Seton Hall University. The Svetlana Masgutova Educational Institute, LLC agrees to the study procedures as described.

After considering this project, we believe this is a noteworthy project and welcome the opportunity to discuss the results when the project is completed.

Sincerely,

Jessica Rife  
Svetlana Masgutova Educational Institution, LLC (SMEI, LLC)  
SMEI Coordinator  
PO Box 1651  
Chiefland, FL 32644  
[jessica@masgutovafoundation.org](mailto:jessica@masgutovafoundation.org)  
352-494-9829

RE: Authorization to Conduct Study and/or Access membership

Dear Jerzie-Ann Coppola,

Thank you for your interest in conducting research in MNRI and for contacting us to be a part of this very important work.

Our organization, Svetlana Masgutova Educational Institute, LLC, is more than willing to assist you with our PhD research work, and would be happy to announce your study to our professionals through email notifications.

Thank you for considering SMEI, LLC for inclusion in this research effort and we look forward to contributing to this endeavor.

Sincerely,



DR. SVETLANA MASGUTOVA  
INTERNATIONAL INSTITUTE  
02-840 Warsaw. Lesna 1 Street  
Poland

Gmail - Re: Permission to announce research study on MNRI Worldwid... <https://mail.google.com/mail/u/0?ik=500c0bb428&view=pt&search=all...>



Jerzie-Ann Coppola <jerzieot@gmail.com>

## Re: Permission to announce research study on MNRI Worldwide Core Specialists

3 messages

wilvankessel@masgutovamethode.nl <wilvankessel@masgutovamethode.nl>

Fri, Jun 26, 2020 at 9:25 AM

To: Jerzie-Ann M Coppola <jerzieann.coppola@student.shu.edu>

Dear Jerzi-Ann,

Ofcourse this is okay. To make sure people understand that this is special asked permission, I can announce you, OR better: you can start with a brief introduction: 'as discussed and approved by the group-owner (what is the word in English?) / moderator of this group, I may present / ask.... etc...

Good luck with your research!

Warm regards,  
Wil van Kessel



- Liaison for Svetlana Masgutova Educational Institute in The Netherlands
- Region Coordinator for MNRI® Events in Europe

European website: <http://masgutovamethod.eu>

Conference The Netherlands: <http://conference.masgutovamethode.nl>



De Kleine Parel • [Siergaarde 47](#) • [2285 JD Rijswijk](#) • [The Netherlands](#) • Phone 06 10 27 72 15

Jerzie-Ann M Coppola schreef op 2020-06-24 22:49:

Dear Administrator,

I am an MNRI Core Specialist and I am also a doctoral student at the University of Seton Hall.

As part of the approval process by Seton Hall University Institutional Review Board, I am required to obtain gatekeeper permission from sites where I recruit participants. Thus, I would like your permission to reach out to your Certified MNRI Core Specialists to conduct this research.

Please see the attached formal letter.

Sincere regards,

Jerzie-Ann Coppola

---

**\*\* WARNING:** This email originated from outside of Seton Hall University. Do not click links or open attachments unless you recognize the sender and know the content is safe. **\*\***

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**Jerzie-Ann Marie Coppola** <jerzieot@gmail.com>  
To: wilvankessel@masgutovamethode.nl

Fri, Jun 26, 2020 at 9:29 AM

Thank you Wil,

I don't anticipate this will happen to until late fall. I will touch base with you when the time gets closer.

Warm regards,

Jerzie-Ann  
[Quoted text hidden]

---

**wilvankessel@masgutovamethode.nl** <wilvankessel@masgutovamethode.nl>  
To: Jerzie-Ann Marie Coppola <jerzieot@gmail.com>

Fri, Jul 10, 2020 at 5:21 PM

Okay, keep me posted... goodluck!

Warm regards,  
Wil van Kessel



- Liaison for Svetlana Masgutova Educational Institute in The Netherlands
- Region Coordinator for MNRI® Events in Europe

European website: <http://masgutovamethod.eu>  
Conference The Netherlands: <http://conference.masgutovamethode.nl>



*De Kleine Parel • Siergaarde 47 • 2285 JD Rijswijk • The Netherlands • Phone 06 10 27 72 15*

Jerzie-Ann Marie Coppola schreef op 2020-06-26 15:29:

[Quoted text hidden]

## **Appendix C**

### **Instrument Permissions from Original Authors**

Jerzie-Ann Coppola <[jerzieot@gmail.com](mailto:jerzieot@gmail.com)>**RE: Research Spider- Request for Assistance**

2 messages

**Helen Elizabeth Smith (Prof)** <[h.e.smith@ntu.edu.sg](mailto:h.e.smith@ntu.edu.sg)>

Mon, Oct 12, 2020 at 2:42 AM

To: "jerzieann.coppola@student.shu.edu" <[jerzieann.coppola@student.shu.edu](mailto:jerzieann.coppola@student.shu.edu)>

Dear Jerzie-Ann

I apologise that you have been having difficulty contacting me. I would be delighted to grant you permission to use the Research Spider, and would love to hear about your results.

You mention about additional information of scoring, we scored it without waiting the variables. We often used it to look at the educational need of a groups of people, when we would take the range and average score highlight the priority for education.

Please do get back to me with specific questions- I would be happy to help.

Helen Smith

**From:** [christian.apfelbacher@med.ovgu.de](mailto:christian.apfelbacher@med.ovgu.de) <[christian.apfelbacher@med.ovgu.de](mailto:christian.apfelbacher@med.ovgu.de)>**Sent:** Monday, October 5, 2020 3:54 AM**To:** Helen Elizabeth Smith (Prof) <[h.e.smith@ntu.edu.sg](mailto:h.e.smith@ntu.edu.sg)>**Subject:** WG: Research Spider- Request for Assistance

Dear Helen,

may I bring this to your attention?

Best wishes,

Christian

**Von:** Jerzie-Ann M Coppola <[jerzieann.coppola@student.shu.edu](mailto:jerzieann.coppola@student.shu.edu)>**Gesendet:** Sonntag, 4. Oktober 2020 19:04**An:** Apfelbacher, Christian Joachim <[christian.apfelbacher@med.ovgu.de](mailto:christian.apfelbacher@med.ovgu.de)>**Betreff:** Research Spider- Request for Assistance

Good Afternoon,

I hope this email finds you and your family well. I am reaching out to learn more about the Attitudes Towards Research Scale. As a doctoral student at Seton Hall University, I am interested in examining the research knowledge, attitudes, and skill in an interdisciplinary professional group. The purpose of this email is to see if this tool is available for purchase.

Regards,

Jerzie-Ann Coppola



**Elena C. Papanastasiou** to you

Sep 27, 2020

Hello Jerzie-Ann,  
You can use the scale for free. There is no fee associated with its use.  
good luck with your research. I would love to learn about your results once you eventually have them.



**Jerzie-Ann Marie Coppola**

Oct 1, 2020

Dr. Papanastasiou,

Thank you for your prompt reply. I will be certain to forward you my abstract and any results should my committee approve the use of this tool for my study. Is there any additional scoring information that is needed to supplement the information that can be found in two articles describing the revised questionnaire?

Thank you again for your assistance.

Jerzie-Ann



**Elena C. Papanastasiou** to you

Oct 4, 2020

Hello again

Firefox

<https://outlook.office.com/mail/search/id/AAQkADg5N2JkOGFhLWZ...>**RE: Research Knowledge Assessment - Request for tool availability.**

Glenn Lambie &lt;Glenn.Lambie@ucf.edu&gt;

Fri 10/2/2020 6:26 AM

To: Jerzie-Ann M Coppola &lt;jerzieann.coppola@student.shu.edu&gt;

 1 attachments (114 KB)

The Research Knowledge Assessment 08-31-2016 With Answers.doc;

Good morning Jerzie-Ann,

I hope you are well.

I attached the Research Knowledge Assessment for you, which is free to use, I just ask that you cite the measure in your work.

Please let me know if you have any questions or concerns.

Good luck and take care,  
Glenn

Glenn W. Lambie, Ph.D., NCC, NCSC, NCCMHC  
Professor and Associate Dean of Graduate Affairs & Faculty Excellence  
Robert N. Heintzelman Eminent Scholar Endowed Chair  
College of Community Innovation & Education  
P.O. Box 161250  
Orlando, FL 32816-1250

Telephone: (407) 823-4779  
E-mail: Glenn.Lambie@ucf.edu

---

**From:** [Jerzie-Ann M Coppola](#)**Sent:** Thursday, October 1, 2020 6:14 PM**To:** [Glenn Lambie](#)**Subject:** Research Knowledge Assessment - Request for tool availability.

Dr. Lambie

I hope this email finds you well and I apologize that this is a duplicate request, as I also attempted to reach you through Researchgate. I know that some scholars do not check that email often. As a doctoral student with Seton Hall University I am interested in examining the foundational research knowledge of an interdisciplinary group of professionals. The purpose of this email is to inquire whether you have made this tool available for use or purchase. Since this tool appears to directly measure research knowledge, not self reported perception of knowledge, I would be interested in utilizing this tool for my study.

Thank you in advance for any assistance you can provide.

Sincerely,

Jerzie-Ann Coppola

**Appendix D**  
**Letter of Solicitation**



## Informed Consent Form

### Dear Prospective Participant,

My name is Jerzie-Ann Coppola and I am a doctoral student at Seton Hall University. I am conducting a research study in partial fulfillment of my dissertation requirement for the PhD in Health Science degree. You are invited to take part in this study.

**Title of Research Study:** Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists.

**Principal Investigator:** Jerzie-Ann Coppola, Doctoral Student

**Department Affiliation:** Department of Interprofessional Health Sciences and Health Administration, School of Health and Medical Sciences

**Sponsor:** This research is supported by Seton Hall School of Health and Medical Sciences.

### **Brief summary about this research study:**

The following summary of this research study is to help you decide whether or not you want to participate in the study. You have the right to ask questions at any time.

The purpose of this study is to explore research knowledge, attitude, and practice of MNRI® Core Specialists.

You will be asked to complete an online survey questionnaire.

We expect that you will be in this research study for 15-25 minutes.

The primary risk of participation is minimal.

The main benefit of participation is to help establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice.

### **Purpose of the research study:**

The purpose of this study is to explore MNRI® Core Specialists' research knowledge, attitude, and practice. You are invited to participate in this study as an opportunity to share your research knowledge, attitude, and practice.

School of Health and Medical Sciences  
Department of Interprofessional Health Sciences  
and Health Administration  
Interprofessional Health Sciences Campus (IHS)  
123 Metro Boulevard, Nutley, NJ 07110  
[www.shu.edu](http://www.shu.edu)

What great minds can do.

You are being asked to take part in this research study because you have been identified as:

- MNRI® Core Specialist
- Proficient in Reading and Writing English
- Have Access to the web-based survey questionnaire
- Are 18 years of age or older

Your participation in this research study is expected to be for 15-25 minutes. Answer the survey based on your point of view. It is important to answer each section completely. You may complete the survey by clicking on the link at the end of this document.

You will be one of 147 people who are expected to participate in this research study.

**What you will be asked to do:**

Your participation in this research study will include:

Completion of a one-time web-based questionnaire. In general, you will be asked questions regarding your research knowledge, attitude, and practice. You will complete this survey using a mobile device, laptop/personal computer, or tablet. The study will take place online. The web-based questionnaire consists of 108 questions.

**The questionnaire will include (5) parts:**

**Part 1:** Qualifying

**Part 2:** Instrumentation

- a. Research Knowledge Assessment (Lambie, 2012)
- b. Attitudes Toward Research Questionnaire (Papanastasiou, 2005; Papanastasiou, 2014).
- c. Wessex Research Network Spider (Smith et al., 2002).

**Part 3:** Research Practice

- a. Open Ended Questions
- b. Research Engagement

**Part 4:** Research Attitude

**Part 5:** Professional and Personal Factors (Non-identifying demographics)

The estimated time to complete this questionnaire is 15-25 minutes. Answer the survey based on your point of view. It is important to answer each section completely. There is no expectation for how an MNRI® Core Specialists will perform on this study survey. All sections of the survey questionnaire are important for data collection.

The three instruments included in the study survey have been established in the literature as valid and reliable tools.

The Research Knowledge Assessment (RKA) by Lambie (2012) is a 50-item multiple choice assessment of knowledge of research methodology.

*Here is an example of a question from this instrument:*

*“A(n) \_\_\_\_\_ offers the LEAST control of quality of information”:*

- *Referred Journal*
- *Internet Source*
- *ERIC Document*
- *Peer Reviewed Book*

The Attitudes Toward Research Scale (ATRS) is a 30-item self-report measures using a 7-point Likert scale from strongly disagree to strongly agree (Papanastasiou, 2005; Papanastasiou, 2014) that examines attitude to research.

*Here is an example of a question from this instrument:*

*“Research is useful to my career” (Disagree-Agree)*

Wessex Research Network Spider, commonly called “research spider” (Smith et al., 2002), is a self-assessment of research experience for 10 discrete research activities on a 5-point Likert scale from no experience to very experienced.

*Here is an example of a question from this instrument:*

Rate your level of experience:

“Using qualitative research methods” (No Experience – Very Experienced)

**Your rights to participate, say no or withdraw:**

Participation in research is voluntary. You can decide to participate or not participate. You can choose to participate in the research study now and then decide to leave the research at any time by exiting the survey or closing your web browser. Your choice will not be held against you. No record will be kept regarding whether or not your survey was completed.

The person in charge of the research study can remove you from the research study without your approval. Possible reasons for removal include an incomplete survey questionnaire, non-compliance with the study procedure, or if the individual does not meet the inclusion criteria.

**Potential benefit:**

There may be no direct benefit to you from this study. You may obtain personal satisfaction from knowing that you are participating in a project that contributes to new information regarding research knowledge, attitude, and practice.

**Potential risks:**

The risks associated with this study are minimal in nature. To the best of our knowledge, the things you will be doing have no more risk of harm than you would have in everyday life.

**Confidentiality and privacy:**

Efforts will be made to limit the use or disclosure of your personal information. This information may include the research study documents or other source documents used for the purpose of conducting the study. These documents may include any downloaded data from Survey Monkey®. We cannot promise complete secrecy. Organizations that oversee research safety may inspect and copy your information. This includes the Seton Hall University Institutional Review Board who oversees the safe and ethical conduct of research at this institution.

This survey is being hosted by Survey Monkey® and involves a secure connection. Terms of service, addressing confidentiality, may be viewed at [https://help.surveymonkey.com/articles/en\\_US/kb/surveymonkey-gdpr](https://help.surveymonkey.com/articles/en_US/kb/surveymonkey-gdpr).

Upon receiving the results of your survey, any possible identifiers will be deleted by the investigator. You will be identified only by a unique subject number. No email addresses will be collected as part of this study. All data will be kept on a password protected encrypted USB memory key with the password known only to the primary investigator. The USB memory key will also remain in a locked cabinet at the dissertation chair's office for a period of 3 years following graduation, after which time all data will be destroyed.

The results of the research study may be published, but your name will not be used.

**Data sharing:**

De-identified data from this study may be shared with the research community at large to advance knowledge. We will remove or code any personal information that could identify you before files are shared with other researchers to ensure that, by current scientific standards and known methods, no one will be able to identify you from the information we share. Despite these measures, we cannot guarantee anonymity of your personal data.

**Cost and compensation:**

You will not be responsible for any of the costs or expenses associated with your participation in this study.

There is no payment for your time to participate in this study.

**Conflict of interest disclosure:**

The principal investigator and members of the study team have no financial conflicts of interest to report.

**Contact information:**

If you have questions, concerns, or complaints about this research project, you can contact the Seton Hall University Institutional Review Board ("IRB") at (973) 761-9334 or [irb@shu.edu](mailto:irb@shu.edu).

If you want a copy of this consent for your records, you can print it from the screen.

**Ways to Participate:**

The questionnaire is available via Survey Monkey® electronic survey.

If you are interested in participating, please click the link provided below. If you choose not to participate, thank you for your time reviewing this information.

If you wish to participate, please click the “I Agree” button and you will be taken to the survey.

[I Agree](#)

If for some reason you are not directed to the survey, copy and paste the following URL in your web browser.

<https://www.surveymonkey.com/r/MNRI>

If you do not wish to participate in this study, please select exit the browser.

Thank you for your consideration in participating and contributing to this research. Your time and contribution to my dissertation is greatly appreciated.

**Jerzie-Ann Coppola, MS, OTR/L**  
**Doctoral Candidate**  
**Seton Hall University**  
**Department of Interprofessional Health Sciences and Health Administration**  
**School of Health and Medical Sciences**

## **Appendix E**

### **Letter of Solicitation Cover Email & Reminder Email**

*[Email Subject]* Doctoral Dissertation Study Invitation: Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists.

Dear MNRI® Core Specialists,

My name is Jerzie-Ann Coppola and I am a doctoral student at Seton Hall University in the Department of Interprofessional Health Sciences and Health Administration, School of Health and Medical Sciences. I am conducting a research study in partial fulfillment of my dissertation requirement for my PhD in Health Sciences degree.

You are invited to participate in this study entitled, “Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists.” Please find additional details regarding participation in the attached letter.

Thank you for your time and consideration.

Best Regards,

**Jerzie-Ann Coppola, MS, OTR/L**

**Doctoral Candidate**

**Seton Hall University**

**Department of Interprofessional Health Sciences and Health Administration**

**School of Health and Medical Sciences**

[Email Subject] Doctoral Dissertation Study Invitation: Exploring Research Knowledge, Attitude, and Practice of MNRI®

Core Specialists.

Dear MNRI® Core Specialists,

I recently provided you with an invitation to participate in my dissertation study. This note serves as friendly reminder to please complete the survey if you are interested in participating. If you chose not to participate, please disregard this message.

For your reference, I have included a brief description of the study below as well as in the attached Letter of Solicitation.

My name is Jerzie-Ann Coppola and I am a doctoral student at Seton Hall University in the Department of Interprofessional Health Sciences and Health Administration, School of Health and Medical Sciences. I am conducting a research study in partial fulfillment of my dissertation requirement for my PhD in Health Sciences degree.

You are invited to participate in this study entitled, “Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists.” Please find additional details regarding participation in the attached letter.

Thank you for your time and consideration.

Best Regards,

**Jerzie-Ann Coppola, MS, OTR/L**

**Doctoral Candidate**

**Seton Hall University**

**Department of Interprofessional Health Sciences and Health Administration**

## **Appendix F**

### **Facebook Post- Recruitment through private Facebook Group “Worldwide MNRI® Core Specialists”**

**[Post]:** With permission from the group administrator:

My name is Jerzie-Ann Coppola and I am a doctoral student at Seton Hall University. I am conducting a research study in partial fulfillment of my dissertation requirement for the PhD in Health Science degree. You are invited to take part in this study.

Title of Research Study: ***Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists.***

Principal Investigator: ***Jerzie-Ann Coppola, Doctoral Student***

Department Affiliation: Department of Interprofessional Health Sciences and Health Administration, School of Health and Medical Sciences

Sponsor: This research is supported by Seton Hall School of Health and Medical Sciences.

Brief summary about this research study:

The following summary of this research study is to help you decide whether or not you want to participate in the study. You have the right to ask questions at any time.

***The purpose of this study is*** to explore research knowledge, attitude, and practice of MNRI® Core Specialists.

You will be asked to complete an online survey questionnaire.

We expect that you will be in this research study for 15-25 minutes.

The primary risk of participation is minimal.

The main benefit of participation is to help establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice.

Click this URL to participate in the survey via SurveyMonkey®:

<https://www.surveymonkey.com/r/MNRI>

## Participants Needed:

### Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists

Online Study Exploring MNRI® Core  
Specialists' Research Knowledge,  
Attitude, & Practice.

15-25 Minutes

#### You are eligible if...

- You are a MNRI® Core Specialist**
- You are proficient in reading/writing English**
- You are 18 years old or older**

To participate:  
<https://www.surveymonkey.com/r/MNRI>



#### Contact Information:

Primary Investigator  
Jerzie-Ann Coppola

Dr. Deborah Deluca  
Dissertation Chair  
Department of Interprofessional Health  
Sciences and Health Administration  
School of Health and Medical Sciences  
Seton Hall University  
(973) 275-2842  
Deborah.deluca@shu.edu.

Michael La Fountaine, Ed.D.  
Director of the Institutional Review Board  
Associate Professor  
(973) 313-6314  
(973) 275-2978 (fax)  
Michael.lafontaine@shu.edu

## Appendix G

### Flesch-Kincaid Readability Score for the Letter of Solicitation

**Figure G.1**

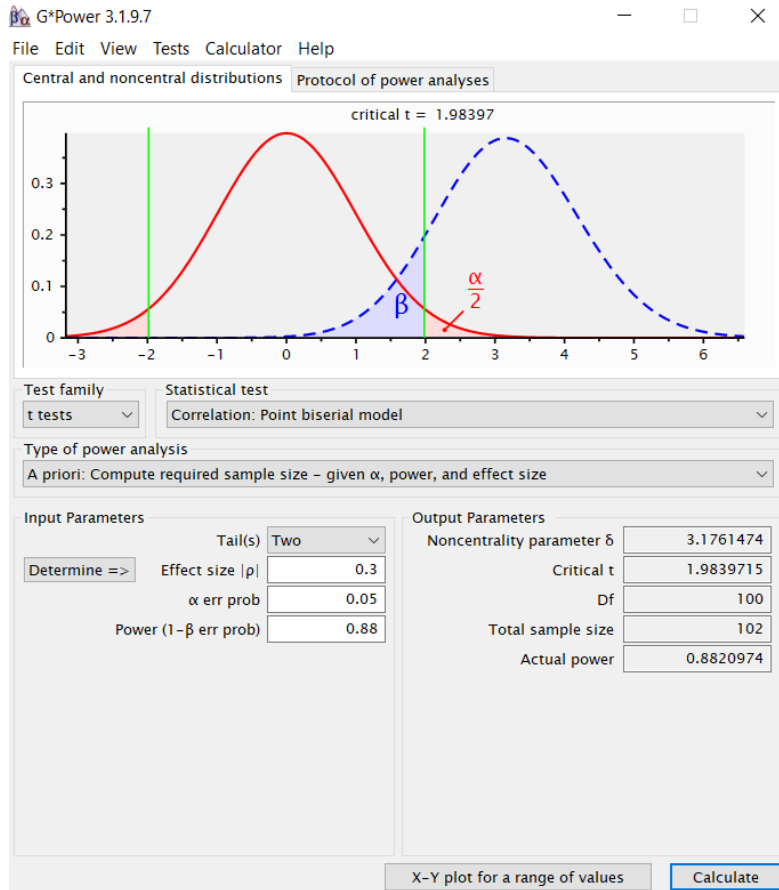
*Readability Score*

Readability Statistics	
<b>Counts</b>	
Words	1,436
Characters	7,865
Paragraphs	88
Sentences	78
<b>Averages</b>	
Sentences per Paragraph	1.9
Words per Sentence	15.2
Characters per Word	5.1
<b>Readability</b>	
Flesch Reading Ease	45.4
Flesch-Kincaid Grade Level	10.6
Passive Sentences	30.7%
OK	

*Note.* The study participants are all certified MNRI® Core Specialists. MNRI® Core Specialists have a Bachelor Degree or higher. Therefore, the Flesch-Kincaid Grade Level of 10.6 is appropriate for the study population.

## **Appendix H**

### **A Prior G\*Power Analysis**

**Figure H.1***A priori power calculation*

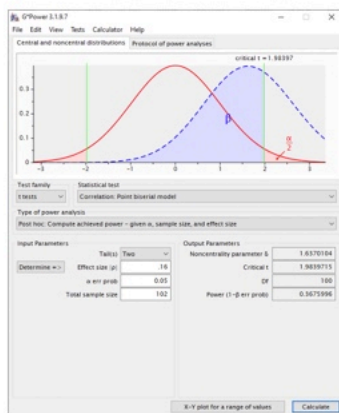
*Note.* The desired sample size for this study was 118. This was determined by running a G\*Power Analysis and adding 15% for attrition.

## **Appendix I**

### **Post Hoc Power Analysis RQ7-9**

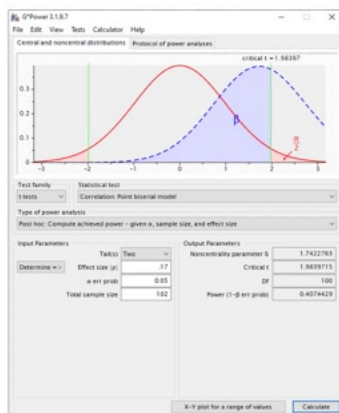
**Figure I.1***Post Hoc Power Analysis for RQ7a-c*

**RQ7a:** Is there a relationship between  
Educational Degree and Research Knowledge?



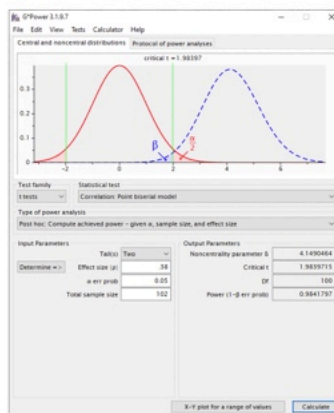
Alpha of 0.05  
Power = 0.37  
Medium Effect Size: (0.3)  
2 tailed test

**RQ7b:** Is there a relationship between  
Educational Degree and Research Attitude?



Alpha of 0.05  
Power = 0.40  
Medium Effect Size: (0.3)  
2 tailed test

**RQ7c:** Is there a relationship between  
Educational Degree and Research Practice?



Alpha of 0.05  
Power = 0.98  
Medium Effect Size: (0.3)  
2 tailed test

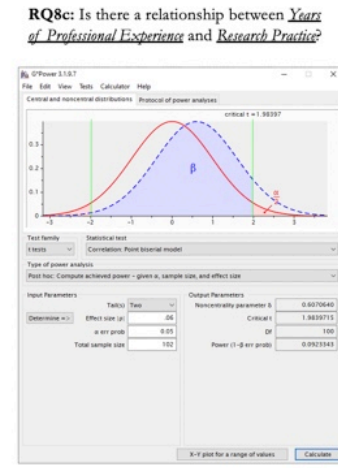
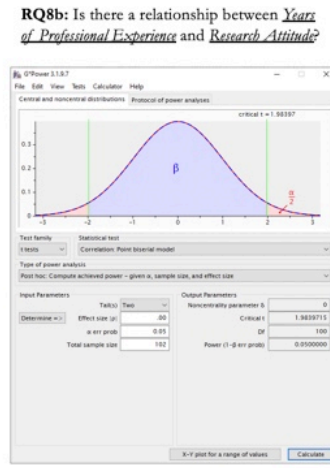
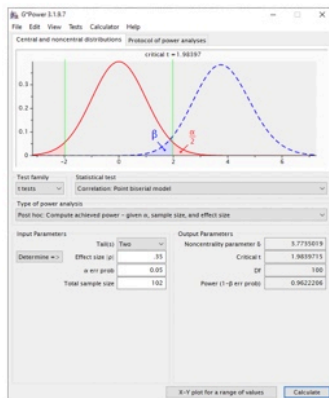
**Figure I.2***Post Hoc Power Analysis for RQ8a-c*

Figure I.3

*Post Hoc Power Analysis for RQ9a-c*

**RQ9a:** Is there a relationship between  
Research Knowledge and Research Attitude?



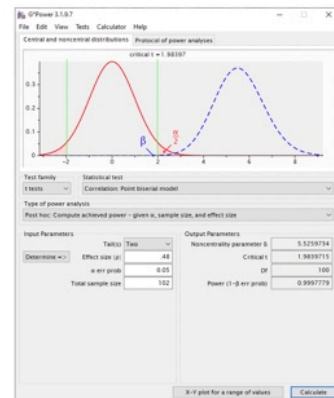
Alpha of 0.05  
Power = 0.96  
Medium Effect Size: (0.3)  
2 tailed test

**RQ9b:** Is there a relationship between  
Research Knowledge and Research Practice?



Alpha of 0.05  
Power = 0.62  
Medium Effect Size: (0.3)  
2 tailed test

**RQ9c:** Is there a relationship between  
Research Attitude and Research Practice?



Alpha of 0.05  
Power = 0.99  
Medium Effect Size: (0.3)  
2 tailed test

## **Appendix J**

### **Survey Study**

**Exploring Research Knowledge, Attitude, and Practice of MRNI® Core Specialists**

**For the full survey contact the PI at [Jerzieann.coppola@student.shu.edu](mailto:Jerzieann.coppola@student.shu.edu)**

## Exploring Research Knowledge, Attitude, & Practice of MNRI® Core Specialists



### Informed Consent Form

Dear Prospective Participant,

My name is Jerzie-Ann Coppola and I am a doctoral student at Seton Hall University. I am conducting a research study in partial fulfillment of my dissertation requirement for the Ph.D. in Health Science degree. You are invited to take part in this study.

**Title of Research Study:** Exploring Research Knowledge, Attitude, and Practice of MNRI® Core Specialists

**Principal Investigator:** Jerzie-Ann Coppola, Doctoral Student

**Department/Affiliation:** Department of Interprofessional Health Sciences and Health Administration, School of Health and Medical Sciences

**Sponsor:** This research is supported by Seton Hall School of Health and Medical Sciences.

#### Brief summary about this research study:

The following summary of this research study is to help you decide whether or not you want to participate in the study. You have the right to ask questions at any time.

The purpose of this study is to explore research knowledge, attitude, and practice of MNRI® Core Specialists.

You will be asked to complete an online survey questionnaire.

We expect that you will be in this research study for 15-25 minutes.

The primary risk of participation is minimal.

The main benefit of participation is to help establish a baseline understanding of MNRI® Core Specialists' research knowledge, attitude, and practice.

**Purpose of the research study:**

The purpose of this study is to explore MNRI Core Specialists' research knowledge, attitude, and practice. You are invited to participate in this study as an opportunity to share your research knowledge, attitude, and practice.

You are being asked to take part in this research study because you have been identified as:

- § MNRI® Core Specialist
- § Proficient in Reading and Writing English
- § Have Access to the web-based survey questionnaire
- § Are 18 years of age or older

Your participation in this research study is expected to be for 15-25 minutes. Answer the survey based on your point of view. It is important to answer each section completely. You may complete the survey by clicking on the link at the end of this document.

You will be one of 147 people who are expected to participate in this research study.

**What you will be asked to do:**

Your participation in this research study will include:

Completion of a one-time web-based questionnaire. In general, you will be asked questions regarding your research knowledge, attitude, and practice. You will complete this survey using a mobile device, laptop/personal computer, or tablet. The study will take place online. The web-based questionnaire consists of 108 questions.

The questionnaire will include (5) parts:

- Part 1: Qualification
- Part 2: Introduction
  - a. Research Knowledge Assessment (Lambie, 2012)
  - b. Attitudes Toward Research Questionnaire (Papanastasiou, 2005; Papanastasiou, 2014).
  - c. Westat Research Network Spider (Smith et al., 2002).
- Part 3: Research Practice
  - a. Open-Ended Questions
  - b. Research Engagement
- Part 4: Research Attitude
- Part 5: Professional and Personal Factors (Non-identifying demographics)

The estimated time to complete this questionnaire is 15-25 minutes. Answer the survey based on your point of view. It is important to answer each section completely. There is no expectation for how an MNRI® Core Specialists will perform on this study survey. All sections of the survey questionnaire are important for data collection.

The three instruments included in the study survey have been established in the literature as valid and reliable tools.

The Research Knowledge Assessment (RKA) by Lambie (2012) is a 50-item multiple-choice assessment of knowledge of research methodology.

*Here is an example of a question from this instrument:*

"A(n) \_\_\_\_\_ offers the LEAST control of quality of information"

- Referred Journal
- Internet Source
- ERIC Document
- Peer-Reviewed Book

The Attitudes Toward Research Scale (ATRS) is a 30-item self-report measure using a 7-point Likert scale from strongly disagree to strongly agree (Papanastasiou, 2005; Papanastasiou, 2014) that examines attitudes to research.

*Here is an example of a question from this instrument:*

"Research is useful to my career" (Disagree- Agree)

Wessex Research Network Spider, commonly called "research spider" (Smith et al., 2002), is a self-assessment of research experience for 10 discrete research activities on a 5-point Likert scale from no experience to very experienced.

*Here is an example of a question from this instrument:*

Rate your level of experience on the following:

"Using qualitative research methods" (No Experience - Very Experienced)

## Exploring Research Knowledge, Attitude, & Practice of MNRI® Core Specialists

### Your rights to participate, say no or withdraw:

Participating in research is voluntary. You can decide to participate or not participate. You can choose to participate in the research study now and then decide to leave the research at any time by exiting the survey or closing your web browser. Your choice will not be held against you. No record will be kept regarding whether or not your survey was completed.

The person in charge of the research study can remove you from the research study without your approval. Possible reasons for removal include an incomplete survey questionnaire, non-compliance with the study procedure, or if the individual does not meet the inclusion criteria.

### Potential benefit:

There may be no direct benefit to you from this study. You may obtain personal satisfaction from knowing that you are participating in a project that contributes to new information regarding research knowledge, attitude, and practice.

### Potential risks:

The risks associated with this study are minimal in nature. To the best of our knowledge, the things you will be doing have no more risk of harm than you would have in everyday life.

### Confidentiality and privacy:

Efforts will be made to limit the use or disclosure of your personal information. This information may include the research study documents or other source documents used for the purpose of conducting the study. These documents may include any downloaded data from Survey Monkey®. We cannot promise complete secrecy. Organizations that oversee research safety may inspect and copy your information. This includes the Seton Hall University Institutional Review Board who oversees the safe and ethical conduct of research at this institution. This survey is being hosted by Survey Monkey® and involves a secure connection. Terms of service, addressing confidentiality, may be viewed at [https://help.surveymonkey.com/articles/en\\_US/kb/surveymonkey-gdpr](https://help.surveymonkey.com/articles/en_US/kb/surveymonkey-gdpr).

Upon receiving the results of your survey, any possible identifiers will be deleted by the investigator. You will be identified only by a unique subject number. No email addresses will be collected as part of this study. All data will be kept on a password-protected encrypted USB memory key with the password known only to the primary investigator. The USB memory key will also remain in a locked cabinet at the dissertation chair's office for a period of 3 years following graduation, after which time all data will be destroyed.

The results of the research study may be published, but your name will not be used.

### Data sharing:

De-identified data from this study may be shared with the research community at

large to advance knowledge. We will remove or code any personal information that could identify you before files are shared with other researchers to ensure that, by current scientific standards and known methods, no one will be able to identify you from the information we share. Despite these measures, we cannot guarantee anonymity of your personal data.

**Cost and compensation:**

You will not be responsible for any of the costs or expenses associated with your participation in this study.

There is no payment for your time to participate in this study.

**Conflict of interest disclosure:**

The principal investigator and members of the study team have no financial conflicts of interest to report.

**Contact information:**

If you have questions, concerns, or complaints about this research project, you can contact the Seton Hall University Institutional Review Board (IRB) at (973) 761-9334 or irb@shu.edu.

If you want a copy of this consent for your records, you can print it from the screen.

**\* Ways to Participate**

If you wish to participate, please click the "I Agree" button and you will be taken to the survey.

If you do not wish to participate in this study, please select exit the browser.

☐ I Agree

**Exploring Research Knowledge, Attitude, &  
Practice of MNRI® Core Specialists**

**Part 1: Qualifying**

\* Are you a *Certified MNRI Core Specialist*?

☐ Yes

☐ No

Do not Copy

**Exploring Research Knowledge, Attitude, &  
Practice of MNRI® Core Specialists**

\* Are you proficient in both reading and writing English?

☐ Yes

☐ No

Do not Copy

**Exploring Research Knowledge, Attitude, &  
Practice of MNRI® Core Specialists**

\* Are you 18 years of age or older?

☐ Yes

☐ No

Do not Copy

## Appendix K

### Foundational Conceptual Topics

#### *Basics of the Nervous System*

To build a contextual understanding of reflexes, which are the primary focus of the The Masgutova Method®, a brief description of the nervous system's structure and a description of the basic components of a reflex is necessary. The primary subdivision of the human nervous system is the peripheral nervous system (PNS), which is "in contact with the environment" (Faber, 1982, p. 5), and the central nervous system (CNS), which consists of the brain and spinal cord, and is responsible for "processing information and providing an appropriate response to the environment" (Faber, p. 5-6).

The PNS can be further sub-divided into the somatic nervous system (SoNS) and the autonomic nervous system (ANS). Although the literature describes a distinction between the SoNS and the ANS, the separation between the SoNS and ANS is less than perfect. The somatic system works through motor nerves, which act on skeletal muscles to foster interaction with the external environment. The autonomic nervous system, utilizing autonomic ganglia, affects smooth muscle, cardiac muscle, and glands and manages and regulates internal physiological functions (Purves et al., 2001; Faber, 1982). **Figure K.1** provides a visual representation of the basic components of the human nervous system.

**Figure K.1***The Nervous System*

<b>The Nervous System</b>	
<b><i>Central Nervous System</i></b>	Brain
	Spinal Cord
<b><i>Peripheral Nervous System</i></b>	Somatic Nervous System
	Autonomic Nervous System <ul style="list-style-type: none"> <li>Parasympathetic Nervous System</li> <li>Sympathetic Nervous System</li> <li>Non-Myelinated Vagus Nerve</li> <li>Enteric Nervous System</li> </ul>

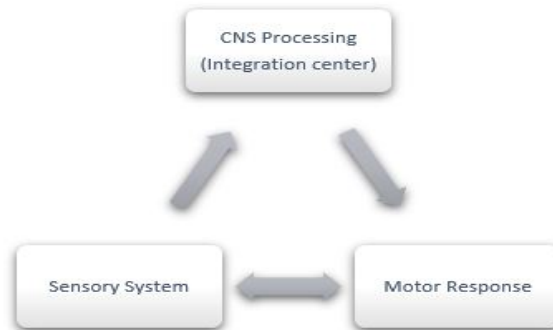
*Note.* Adapted from *The Method: Reflex Physiology & The Nervous System*, by The Svetlana Masgutova Educational Institute. *Masgutova Method*®. <https://masgutovamethod.com/the-method/reflex-physiology-the-nervous-system>. Copyright 2022f Svetlana Masgutova Educational Institute.

***Physiology of a Reflex***

Conceptually, "the basic unit of integrated reflex activity is the reflex arc" (Barrett et al., 2010, p. 157), consisting of sensory stimulus (receptor and sensory neuron), central nervous system processing, and motor response (motor neuron and its effector), and is the most simplistic physiological representation available to understand reflex activity (Sherrington, 1906; SMEI, LLC, 2022f, para. 1).

**Figure K.2**

*Simplistic Visual Representation of a Reflex Circuit*



*Note.* Adapted from "MNRI® Assessment for Determining the Level of Reflex Development," by S. Masgutova & D. Masgutov. In M. Rentchler, S. Averkamp, S. Masgutova, N. Akhmatova, P. Shackleford, & V. Poston (Main Eds.), *Reflexes: Portal to Neurodevelopment and Learning*. A Collective Work (p. 202). Copyright 2015 SMEI, LLC.

The primary physiological components of a reflex include (a) tactile, proprioceptive, vestibular, auditory, visual, olfactory, or gustatory sensory receptor; (b) sensory neuron, otherwise known as an afferent nerve fiber. A sensory receptor, at one end of the sensory neuron, carries an electrical signal down the length of the neuron called the axon. The axon terminates at the other end of the neuron, in small branchlike endings called dendrites; (c) signals are carried across the synapse to an interneuron or directly to the motor neuron via either an electrical signal (potassium and sodium ions) or via neurotransmitters; (d) CNS processing occurs at the level of the spinal cord or brain; (e) efferent motor fiber; (f) skeletal muscle, smooth muscle, gland, organ, or vascular effector; and the (g) generation of response from the effector (Masgutova & Masgutov, 2017; Lundy-Ekman, 2013). While a reflex arc is the neural pathway and provides a

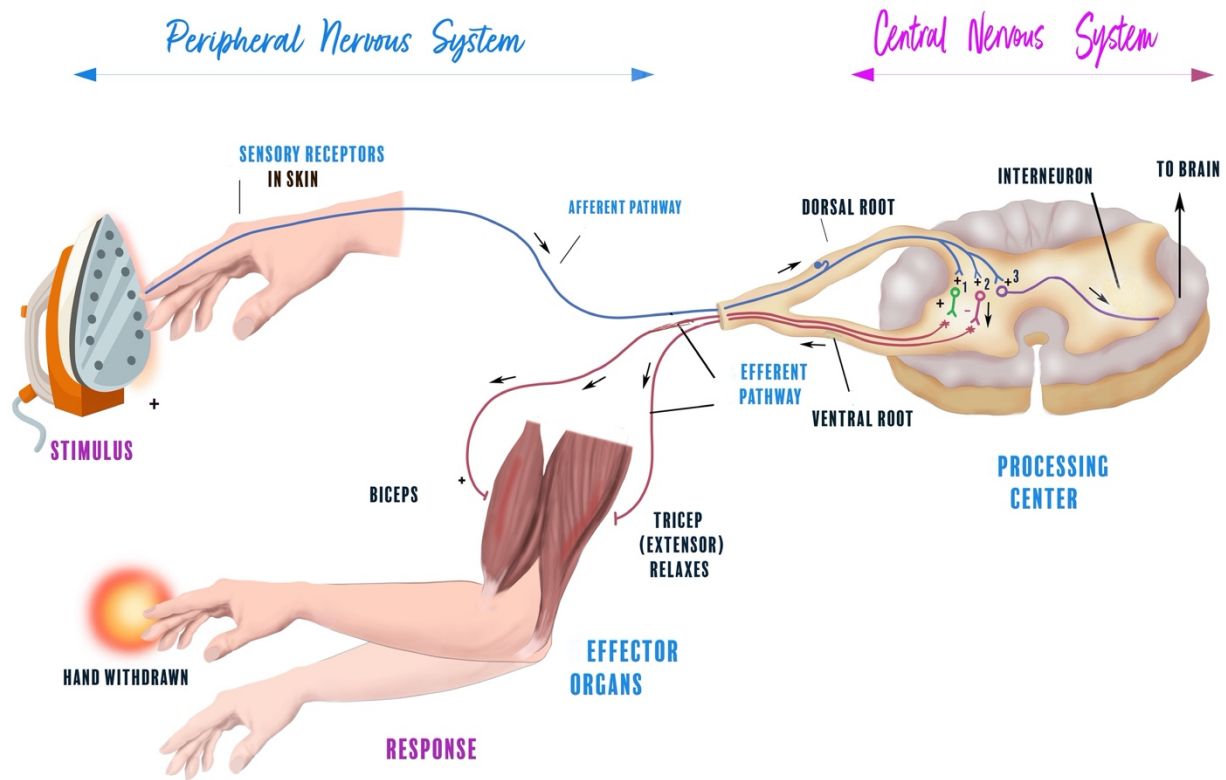
conceptual foundation for understanding reflex activity, the integrative nature of the nervous system is inherently much more complex (Masgutova & Masgutov, 2017).

One of the most commonly known types of reflexes is the deep tendon reflex (also described as monostatic, knee jerk, muscle stretch, and phasic stretch reflex). Physical examination of reflexes by medical professionals provides information regarding "peripheral and spinal circuits and the low level of background excitation in the spinal cord" (Lundy-Ekman, 2013, p. 195). These are the reflexes individuals commonly encounter when a physician or therapist uses a small hammer to apply a quick tap to tendons. The sensory afferent neuron connects directly with the motor efferent neuron in these responses, generating a quick response. An example of this is the knee jerk reflex. All other spinal reflexes involve synapses with one or more interneurons (Lundy-Ekman, 2013).

For a visual representation of a more complex circuit, the conceptualization of the hands pulling (withdrawal reflex) reflex circuit is provided in **Figure K.3**. The scientific literature has yet to map out a detailed physiological circuit for most reflexes. However, the literature has begun to categorize reflexes corresponding to the neurophysiology of the central nervous system (Lundy-Ekman, 2013; Magnus, 1926a; Magnus, 1926b). For example, the primary level of processing for spinal reflexes occurs within the spinal cord (Lundy-Ekman, 2013). Similarly, reflexes facilitating a contralateral response are processed at or above the level of the medulla oblongata (Magnus, 1926a; Magnus, 1926b).

**Figure K.3**

*Visual Conceptualization of the Hands Pulling Reflex*



*Note.* Adapted from "Post trauma recovery in children of Newton, CT using MNRI® reflex integration," by S. Masgutova, 2016, *Journal of Traumatic Stress Disorders & Treatment*, 5(4), p. 4 ([https://www.scitechnol.com/peer-review/posttrauma-recovery-in-children-of-newtownct-using-mnri-reflex-integration-2LcJ.php?article\\_id=5522](https://www.scitechnol.com/peer-review/posttrauma-recovery-in-children-of-newtownct-using-mnri-reflex-integration-2LcJ.php?article_id=5522)). Copyright 2016 by the Journal of Traumatic Stress Disorders & Treatment.

## Appendix L

### Foundational Topic: Range of Evidence in Health Care

#### *Range of Evidence in Health Care*

The health care industry and regulatory agencies strive to identify the most effective and cost-effective practices to support improved client outcomes, quality of care, and patient experience (Stichler et al., 2011; Berwick et al., 2008). Following this, the health care industry emphasizes evidence-based practice (EBP) (Lieberman et al., 2011). This section seeks to inform the reader about a "range of evidence" (Lieberman et al., 2011, p. 3) by defining both EBP and practice-based evidence (PBE). Additionally, the role of PBE in the generation of "evidence supported and evidenced informed practices" is described (Lieberman et al., 2011, p. 1).

#### **Range of Evidence.**

##### *Evidenced Based Practice.*

Evidence based practice (EBP) originated in medicine as evidence-based medicine (EBM). Evidence based medicine (EBM) is a "conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett et al., 1996, p. 71). Essentially, "it's about integrating individual clinical expertise and the best external evidence" (p. 71). Evidence based practice is the convergence of the best research evidence, the clinician's expertise, and the values/expectations of the client (Gibbs, 2003) and may be utilized to inform clinical practice. The current culture of the health care industry emphasizes EBP because "empirically based care is more likely to be cost effective, appropriate, and justified" (Dickinson et al., 2004, p. 117). Within EBP, randomized controlled trials (RCT) and meta-analysis are considered the highest level of research (Kaplan et al., 2013; Horn et al., 2012). EBP

is a top-down, deductive model where information from "randomized trials is then espoused in routine practice via clinical guidelines" (Holmqvist et al., 2015, p. 22).

The Institute of Medicine Roundtable on Evidence Based Medicine set the following goal:

By the year 2020, 90 percent of clinical decisions will be supported by accurate, timely, and up-to-date clinical information, and will reflect the best available evidence. We feel that this presents a tangible focus for progress toward our vision, that Americans ought to expect at least this level of performance, that it should be feasible with existing resources and emerging tools, and that measures can be developed to track and stimulate progress. (Institute of Medicine [IOM], 2009, p. ix)

Despite a push toward EBP, strict adherence to EBP is reportedly low in many practice areas (Mikhail et al., 2005; Holmes et al., 2004). For example, it is estimated that only 54.9% CI [54.3, 55.5] of Americans receive the recommended health care for preventative, acute, and long-term care (McGlynn et al., 2003). In addition, the implementation of research findings into clinical practice is often hindered by the interrelationship between personal and organizational factors and characteristics of the research itself, including methodology (Hicks, 1997; Dickinson et al., 2004; Kitson et al., 1998). In addition, the implementation of research findings into clinical practice is often hindered by the interrelationship between personal and organizational factors and characteristics of the research itself, including methodology (Hicks, 1997; Dickinson et al., 2004; Kitson et al., 1998).

### ***Evidence to Practice Gap.***

The gap between "what is known and what is done" has been described as a "research utilization dilemma" (Estabrooks, 1998, as cited in Logan et al., 1999, p. 38). The Institute of Medicine report entitled *Crossing the Quality Chasm* stated that "between the health care we have and the care we could have lies not just a gap but a chasm" (IOM, 2001, p. 1). Research has revealed many barriers to the adaptation of EBP, including characteristics of the potential knowledge adaptor or practitioner, organizational factors, and qualities intrinsic to the research, such as limited external validity, lack of representation of research participants, and inability to translate intervention from the research to clinical practice (Horn & Gassaway, 2007; Dickinson et al., 2004; Westfall et al., 2000). Balas and Boren's (2000) report that "it takes an average of 17 years for research evidence to reach clinical practice" (p. 66). **Table L.1** Highlights known barriers to EPB.

**Table L.1***Barriers to EBP*

Barrier	Level	Supporting Citations
Cognitive/Practice Style Traits	Personal/Knowledge Adaptor	Korner-Bitensky et al., 2007
Lack of confidence	Personal/Knowledge Adaptor	Dickinson et al., 2004
Poor Motivation	Personal/Knowledge Adaptor	Dickinson et al., 2004
Research Knowledge	Personal/Knowledge Adaptor	Dickinson et al., 2004 Deans et al., 1997
Attitude towards research	Personal/Knowledge Adaptor	Nelson & Steele, 2007
Research Skills (accessing & interpretation)	Personal/Knowledge Adaptor	Nelson & Steele, 2007
Educational Preparation	Knowledge Adaptor	Poster et al., 1992
Access to learning resources	Organizational	Dickinson et al., 2004
Time	Organizational	Dickinson et al., 2004
Staff Transfers	Organizational	Dickinson et al., 2004
Lack of generalizability	Limitations of Methodology	Horn & Gassaway, 2007; Westfall et al., 2007
Lack of cultural sensitivity	Limitations of Methodology	Lieberman et al., 2011;
Lack of community specificity	Limitation of Methodology	Lieberman et al., 2011
Methodologically Flawed Studies	Limitations of Methodology	Steen & Dager, 2013

*Note.* This table highlights some personal, organizational, and methodological factors that may contribute to the evidence to practice gap.

Practice based evidence provides a channel to overcome some of the barriers identified to evidence-based practice.

***Practice Based Evidence.***

Practice based evidence emerged as a response to slow adaptation of research in practice and to address "gaps in the translation" of EBP into practice (Lieberman et al., 2011, p.2). "What

is efficacious in randomized clinical trials is not always effective in the real world of day-to-day practice (Westfall et al., 2007, p. 404). Practice based research (PBR) provides the laboratory that will help generate new knowledge and bridge the chasm between recommended care and improved care" (Westfall et al., 2007, p. 406). Whereas EBP uses a top-down model, evidence from PBE employs a bottom-up, inductive model that highlights associations between variables (Cogan et al., 2014; Horn et al., 2012; Gassaway et al., 2009). "Routine data are used at an individual level ... and used to generate higher-order evidence base" (Holmqvist et al., 2015, p. 22).

PBE synthesizes the "context, experiences, and practices of healthcare providers working in real-world practice settings" (Leeman & Sandelowski, 2012, p. 171) to describe innovations emerging from clinical experience and research conducted in practice settings (Leeman & Sandelowski, 2012; Brownson & Jones, 2009; Dunet et al., 2008) that are "grounded in, informed by, and intended to improve practice" (Westfall et al., 2007, p. 404). Formal PBE research designs can mitigate limitations inherent to traditional observational designs (Horn et al., 2012). For example, PBE research designs focus on patient characteristics to overcome potential confounding factors and enhance ecological validity by including "front-line clinicians" in the study. PBE also helps improve reliability through standardized documentation and training of the "actual process of care" and the use of diverse samples of heterogeneous patients (Horn et al., 2012, p. S127-128).

Reconciliation of PBE with EBP is necessary to "identify best practices" (Lieberman et al., 2011, p. 3). EBP and PBE, although sometimes viewed as competing, are conceptualized as "complementary paradigms, as both are needed in order to build a robust and rigorous science" (Holmqvist et al., 2015, p. 20). Cook & Cook (2016) present a cycle of research activity between

EBP and PBE. In this model, evidence emerging in practice is studied in high-level scientific investigations to confirm causal links. The evidence emerging from systematic trials is adapted within the practice setting, leading to future rigorous investigations (Holmqvist et al., 2015).

**Figure L.1** depicts the cyclical relationship between PBE and EBP that would leverage EBP through an equal partnership with PBE (Cook & Cook, 2016).

### Figure L.1

*Cyclical Relationships Between PBE & EBP*



*Figure 2.* Adapted from "Leveraging evidence-based practice through partnerships based on practice-based evidence," by B. G. Cook & L. Cook, 2016, *Learning Disabilities: A Contemporary Journal*, 14(2), pp. 143-157 (<https://files.eric.ed.gov/fulltext/EJ1118435.pdf>). Copyright 2016 by Learning Disabilities: A Contemporary Journal.

## Appendix M

### The Masgutova Method® Educational Program

Information regarding The Masgutova Method®'s educational programming is presented here to provide background regarding the MNRI® Core Specialists' Internship Program. In addition to continuing educational programming and certification through the Svetlana Masgutova Educational Institute, The Masgutova Graduate School of Neurodevelopmental Sciences welcomed its inaugural class in the Spring of 2021. Graduates of this program will receive a master's degree in Neurodevelopmental Science.

The Svetlana Masgutova Educational Institute (SMEI, LLC), located in Orlando, Florida, provides the educational training in The Masgutova Method® to physical therapists (PT), occupational therapists (OT), speech therapists (ST), and other health-related and education professionals (SMEI, LLC, 2022c). Individuals taking courses hosted by SMEI, LLC, are eligible to receive continuing education credits through the American Occupational Therapy Association (AOTA), American Speech-Language-Hearing Association (ASHA), and National Certification Board for Therapeutic Massage and Bodywork (NCBTMB). Additionally, SMEI, LLC works with individual state physical therapy boards to approve specific classes hosted within that state's jurisdiction (SMEI, LLC, 2022b, para. 1-5).

**Table M.1** and **Table M.2** provide a list of current courses offered by SMEI, LLC in the MNRI® Core Internship program. Core courses are available to anyone seeking additional training in The Masgutova Method®. Advanced classes are reserved for MNRI® Core Specialists and individuals enrolled in the MNRI® Core Specialists Internship program (SMEI, LLC, 2022c, para. 2).

Course offerings in the educational training program are summarized in **Table M.1** and **Table M.2**.

**Table M.1***Course Offerings in the Educational Training Program*

Course Name
MNRI® Dynamic and Postural Reflex Pattern Integration <sup>a, b</sup>
MNRI® Archetype Movement Integration
MNRI® NeuroTactile Reflex Integration I <sup>a</sup>
MNRI® Neurotactile Integration II <sup>b</sup>
MNRI® Lifelong Reflex Integration
MNRI® Visual & Auditory Reflexes Integration <sup>a</sup>
MNRI® Facial Reflex Integration <sup>a, b</sup>
MNRI® Proprioceptive & Cognitive Reflex Integration <sup>a</sup>
MNRI® Birth & Post Birth Reflex Integration <sup>b</sup>
MNRI® Reflex Integration Maximizing Brain Potential
MNRI® Solutions for Dyslexia
MNRI® Reflex Integration for Trauma and PTSD Recovery <sup>b</sup>
MNRI® Reflex Integration for Stress and Trauma
MNRI® Upper Limbs Reflex & Manual Skill Integration <sup>b</sup>
MNRI® Reflex Integration and Dyslexia
MNRI® Reflex Integration for Stress Hormone and Trauma Recovery +
MNRI® Introduction to Intronauts[sic] and Infant Reflexes <sup>b</sup>
MNRI® Reflex Integration for Newborns
Anatomy and Neurophysiological Basis for MNRI®: Brief Introduction
Introduction to MNRI®,
MNRI® Aquatic Reflex Integration <sup>b</sup>
MNRI® Children with Challenges Reflex Integration <sup>b</sup>
MNRI® Dysfunctional & Pathological Reflex Repatterning and Integration <sup>b</sup>
MNRI® Reflex integration & the Basal Ganglia <sup>b</sup>
MNRI® Reflex Integration & Immunology <sup>b</sup>
MNRI® Introduction to Reflex Neuromodulation Protocol for Concussion Recovery <sup>b</sup>
MNRI® Introduction to Reflex Integration for Epilepsy <sup>b</sup>
MNRI® Parent Workshop
Invite Courage & Move Beyond Ciaos with MNRI®

*Note.* Adapted from "MNRI® Educational Courses & Prerequisites," by Svetlana Masgutova Educational Institute, LLC, 2022, *Masgutova Method*®, (<https://masgutovamethod.com/learning-the-method/mnri-educational-courses>). Copyright 2022 by Svetlana Masgutova Educational Institute.

**Table M.2***Advanced Courses of the MNRI® Training Program*

Course Name
MNRI® Neuro-structural Reflex Integration <sup>a, b</sup>
MNRI® Neurosensorimotor Points Activation <sup>b</sup>
MNRI® Oral Facial Reflex Integration 2 <sup>b</sup>
MNRI® IPET Neurotactile Reflex Integration <sup>b</sup>
MNRI® IPET Archetype Movement Reflex Integration <sup>b</sup>
MNRI® IPET Neurostructural Reflex Integration <sup>b</sup>
MNRI® IPET Repatterning and Integration I <sup>b</sup>
MNRI® IPET Repatterning and Integration II <sup>b</sup>
MNRI® Reflex Advanced Assessment Course <sup>b</sup>
MNRI® Master's Level 1 <sup>b</sup>
MNRI® Master's Level 2 <sup>b</sup>
MNRI® Best Practices: Reflex Integration for MNRI® Authorized Clinicians- Level 1

<sup>a</sup> Program is typically offered at an MNRI® Family Educational Conference

<sup>b</sup> Prerequisites required

*Note.* These courses are only offered to professionals who are MNRI® Core Specialists or are completing their Core in Training program with the Svetlana Masgutova Educational Institute. Adapted from "MNRI® Educational Courses & Prerequisites," by Svetlana Masgutova Educational Institute, LLC, 2022, *Masgutova Method®*, (<https://masgutovamethod.com/learning-the-method/mnri-educational-courses>). Copyright 2022 by Svetlana Masgutova Educational Institute.

MNRI® Core Specialists are individuals that have met the minimum requirements outlined in the MNRI® Core Specialist Internship Program (SMEI, LLC, 2022d). While this program is constantly evolving, current requirements are listed in **Table M.3**. There is an estimated 161 MNRI® Core Specialists worldwide as of April 2022. During data collection, this number was estimated at 151.

**Table M.3***MNRI® Core Specialist Requirements*

Requirements
(11) Core MNRI® Courses – Dynamic and Postural Reflex Integration included two times
(5) Advanced IPET Practicum Courses (IPET Neurostructural Reflex Integration, IPET Neurotactile Integration, IPET Archetype Reflex Integration, IPET Repatterning I & II
Minimum of (304) Clinical Hours- Completed at MNRI® Family Educational Conferences and MNRI® Clinics
Case Study outlining the effectiveness of MNRI® with a minimum of 1 client

MNRI® Core Specialist Agreement

*Note.* Adapted from "Learning the Method: Core Specialist Certification Program," by The Svetlana Masgutova Educational Institute, LLC, 2022, *Masgutova Method®*, (<https://masgutovamethod.com/learning-the-method/mnri-core-specialist-certification-program>). Copyright 2022 by Svetlana Masgutova Educational Institute.

Individuals who have not met the above requirements, and are actively training in The Masgutova Method®, participate in the MNRI® Core Specialists Internship Program (SMEI, LLC, 2022e). This progressive program offers four levels of training. To participate in this program, individuals must meet the minimum requirements as outlined in **Table M.4**.

**Table M.4***MNRI® Core Specialists Internship Requirements*

Internship Requirements
MNRI® Training Agreement Completion of (2) core MNRI® Training courses, including MNRI® Dynamic and Postural Reflex Integration Course (6) credit hours in Anatomy and Physiology Hold a BA or BS in a related field <i>or</i> 2,000 hours of training in related wellness field accepted in place of BA or BS Educational Background Worksheet Annual Professional Membership/Licensing Fee

*Note.* Adapted from "Learning the Method: Core Specialist Certification Program," by Svetlana Masgutova Educational Institute, LLC, 2022, *Masgutova Method®*, (<https://masgutovamethod.com/learning-the-method/mnri-core-specialist-certification-program>). Copyright 2022 by Svetlana Masgutova Educational Institute.

Specification for each MNRI® Resource Certification Level is summarized in **Table M.5**.

**Table M.5***MNRI® Resource Certification Levels*

MNRI® Resource Title Awarded	Minimum MNRI® Requirement:	
	Courses	Educational Family Conferences (8 Days)
MNRI® Core Specialist-in Training II	12	4
MNRI® Core Specialists in Training I	8	3
MNRI® Associate II	4	2
MNRI® Associate I	2	1

*Note.* Adapted from "The Method: Work with Certified MNRI® Resource," by Svetlana Masgutova Educational Institute, LLC, 2022, *Masgutova Method®*, (<https://masgutovamethod.com/the-method/work-with-certified-mnri-resource>). Copyright 2022 by Svetlana Masgutova Educational Institute.

## Appendix N

### Key Terms

The following are the key terms that significantly inform this review of The Masgutova Method®.

1. *Primary Reflex* is a unit of the nervous system, consisting of "neural arcs and circuits linking sensory system processing centers, and muscles or glands" (SMEI, 2015a, p. 32; Purves et al., 2001). The term primary reflex is utilized in the MNRI® program to describe what is frequently termed as "primitive reflexes" in the literature. According to The Masgutova Method®, the term primitive "is not completely accurate as it is the primary schema of the brain to build on the nerve net system" to support neurodevelopment and neuromaturation. Thus, the term *primary* is utilized in The Masgutova Method® (Masgutova & Masgutov, 2017, p. 52).
2. *The Masgutova Method®* is described as a set of programs consisting of individual "neuromodulating techniques" (Renard-Fontaine, 2017). Neuromodulating techniques, in The Masgutova Method®, are exercises that influence the nervous system's functioning. The literature has described The Masgutova Method® as a "therapy program" (Deiss et al., 2019), "therapeutic modality" (SMEI, LLC, 2015a, p. 32), "therapeutic program" (Akhmatova et al., 2015b, p. 1), "therapy modality" (Bell et al., 2019) and "adjunctive integrative program" (Deiss et al., 2019, p. 32).
3. *Neuromodulating Techniques* are specific exercises within The Masgutova Method®, which directly influence developmental and functional mechanisms within the nervous system (Koberda & Akhmatov, 2016, p. 1). The Masgutova Method® literature has used

"neuromodulation" interchangeably with neurosensorimotor reflex integration. See the neurosensorimotor reflex integration definition below.

4. *Re-Patterning* means "re-education, recoding, and rerouting the reflex nerve pathways specific for dynamic and postural reflex patterns" (Deiss et al., 2019, p. 31). The term "*reflex integration*" may more accurately represent exercises within The Masgutova Method® and is often used interchangeably in The Masgutova Method® literature.
5. *Patterning* means educating, coding, and routing reflex nerve pathways for specific dynamic and postural reflex patterns that were not previously present or may have been pruned intensively at the beginning of development. Patterning occurs when a reflex is still in its automatic unconditioned state during the corresponding age of automaticity in infancy.
6. *Reflex integration exercises* are techniques within The Masgutova Method® that either re-pattern or pattern the reflex nerve pathways specific for reflexes and sensory system development (tactile, visual, auditory, etc.).
7. *Neurosensorimotor Reflex Integration*: According to The Masgutova Method®, neurosensorimotor reflex integration is conceptually different from *reflex inhibition* (i.e., reflexes disappear). Neurosensorimotor reflex integration refers to engaging underlying neurological sensory and motor connections within the reflex circuit to facilitate integration. In this method, reflex patterns are integrated and serve as a foundation for higher-level patterns, movement, processes, and skills. The literature on The Masgutova Method® utilizes the terms *neurosensorimotor reflex integration*, *neuro-integration*, and *neuromodulation techniques* (i.e., exercises) interchangeably.

8. *MNRI® Reflex Assessment* is an assessment developed by Dr. Svetlana Masgutova to evaluate the reflex circuit. The main parameters of the assessment include (1) the sensory-motor aspect of the reflex circuit; (2) the direction of the response; (3) the intensity of the response; (4) the latency or timing of the response; and (5) symmetry of physical response (i.e., speed, sequence, & intensity) (Deiss et al., 2019; Masgutova & Masgutov, 2017). This assessment is referred to repeatedly in The Masgutova Method® literature, described later in this paper. The term *MNRI® Reflex Assessment* has been used interchangeably with other terms such as the *MNRI® Reflex Development Profile*, *MNRI® Assessment of Reflex Development*, *MNRI® Reflex Parameters Assessment*, *MNRI® Exemplary Reflex Pattern Profile*, *MNRI® Neuro-reflex Assessment*, and the *MNRI® Reflex Development Assessment*. See **Appendix O** for more detailed information.
9. *MNRI® Family Educational Conferences*, in the United States, are organized by SMEI, LLC in various locations, including its headquarters in Orlando, Florida. This educational conference serves as the location of the data collection procedures described in The Masgutova Method® literature. MNRI® Family Educational Conferences usually run from 4 to 8 days in the United States. Participants attending these conferences receive an assessment by Dr. Masgutova, six 50-minute sessions of The Masgutova Method®'s Core Programs by a team of MNRI® Core Specialists. Core programs include Neurotactile Reflex Integration, Neurostructural Reflex Integration, Archetype Reflex Integration, Dynamic and Postural Reflex Integration, Oral Facial/Visual Auditory Reflex Integration, & Proprioception and Cognitive Reflex Integration. Lectures, individualized home programing, and personalized training are also included in an MNRI® Family

Educational Conference. The primary goal of the MNRI® Family Education conference is to train parents in their child's home program. Parents act as *therapy partners* and are essential in executing the MNRI® home program. Parental involvement is a distinguishing aspect of the MNRI® Family Educational Conference.

## Appendix O

### Understanding the MNRI® Reflex Assessment

Assessment of reflex development is determined using the MNRI® Reflex Assessment (SMEI, LLC, 2015a, p. 201; Diess et al., 2019). The *MNRI® Reflex Assessment* is described repeatedly throughout published articles and in "*Reflexes: Portal to Neurodevelopment and Learning*" (SMEI, 2015a; Diess et al., 2019). Several terms have been used interchangeably to describe this assessment, including the MNRI® Reflex Parameters Assessment, MNRI® NeuroReflex Assessment, MNRI® Assessment of Reflex Integration, MNRI® Assessment of Reflex Development, MNRI® Reflex Patterns Assessment, MNRI® Reflex Development Assessment, MNRI® Reflex Development Profile Assessment, MNRI® Exemplary Reflex Pattern Profile, and the MNRI® Reflex Development Assessment.

Each reflex is categorized on a continuum based on five reflex parameters, from full integration to dysfunctional/pathological. The categorization of reflexes was based on unpublished data collected during Dr. Masgutova's ongoing clinical work, from 1989 to 2013, of children aged 2-19 years (SMEI, LLC, 2015a, p. 44). Data was collected from children recovering from trauma, children with neuro-deficits, children with learning challenges, gifted children, and neuro-typical children (SMEI, 2015a, p. 44).

The level of reflex functioning is calculated for each reflex using a scale of 1-20. Scores between 1-11.00 indicate *dysfunctional and pathological function*. Scores of 11.99 and above are considered *functional*. A level of reflex function at or above 16 indicates *correctly developed-normal* reflex function. A score below 4 is considered *pathological*. **Table O.1** describes the levels of reflex functioning.

**Table O.1***Level of Reflex Functioning*

Level of Function	Score	Level of Reflex Integration
Normal	20	Full/Complete Integration
	18-19.99	Mature and integrated
	16-17.99	Correctly developed-normal
	14-15.99	Functional, low-level
	12-13.99	Functional, very low level
	11.99	Marginal pathology and dysfunction
Dysfunctional and Pathological Function	10-11.99	Marginal pathology and dysfunction
	8-9.99	Incorrect, light dysfunction
	6-7.99	Dysfunction
	4-5.99	Sever Dysfunction
	2-3.99	Pathology
	0-1.99	Severe Pathology

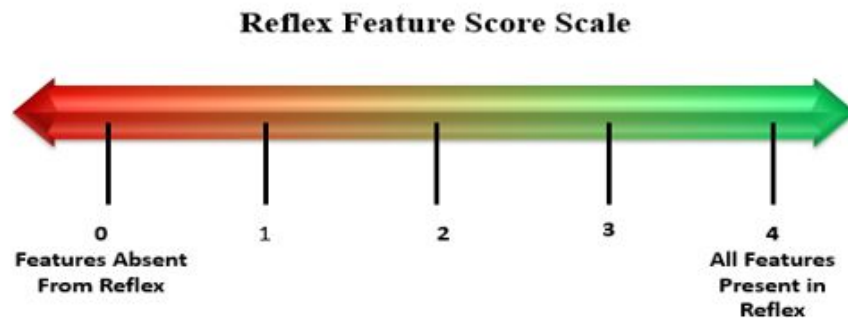
*Note.* Adapted from "Masgutova Neurosensory Reflex Integration (MNRI) Neuromodulation Techniques induces Positive Brian Maps (QEEG) Changes," by J. L. Koberda, N. Akhmatova, A. Bienkiewicz, K. Nowak, & H. Nawrocka, 2016, *Journal of Neurology and Neurobiology*, 2.4, p.2 (<https://sciforschenonline.org/journals/neurology/article-data/JNNB-2-130/JNNB-2-130.pdf>). Copyright 2016 Journal of Neurology and Neurobiology.

The assessment details parameters for 30 reflex patterns for reflex functionality (Masgutova, 2016, p. 6). For each pattern, five parameters are described. Each parameter consists of 4 features. Generally, the unconditioned reaction to proper sensory stimulation is evaluated in infants and young children, whereas an 'ideal' motor response is evaluated for older children and adults (Masgutova, 2016, p. 4). Although math professor A. Krefft, a math professor, validated the scoring system, meaning the scale from 0-20 can offer statistical significance (Koberda et al., 2016). However, validation studies for the administration of this assessment, including reliability and validity studies, have not been reported in the literature.

**Figure O.1** visually depicts the reflex feature score scale with intervals from 0-4 (Koberda et al., 2016).

**Figure O.1**

Reflex Feature Score Scale



*Note.* Adapted from Koberda et al., (2016) & Masgutova (2016). From "Masgutova Neurosensorimotor Reflex Integration (MNRI) neuromodulation techniques (i.e., exercises) induces positive brain maps (QEEG) changes," by J. L. Koberda, N. Akhmatova, E. Akhmatova, A. Bienkiewicz, K. Nowak, & H. Nawrocka, 2016, *Journal of Neurology and Neurobiology*, 2.4, pp. 1-8 (<https://sciforschenonline.org/journals/neurology/article-data/JNNB-2-130/JNNB-2-130.pdf>). Copyright 2016 by the Journal of Neurology and Neurobiology.

The first parameter is the "sensory motor circuit" (Masgutova, 2016, p. 4). In this parameter, "the integrity of the neural circuit is assessed by noting the sensitivity to sensory stimulus as well as the level of physical response to the stimulus" (p. 4). The next parameter is "sequence and direction" (p. 4). Here "the fidelity of the motor response to the 'ideal response' is assessed" (p. 4). "Timing and speed" (p. 4), or latency, is the next parameter. In this parameter,

"the response should begin a fraction of a second after stimulation and complete quick enough to fulfill its protective function" (p. 4). The fourth parameter is "intensity" (p. 5). In this parameter, "the level of muscle tone in the motor response should be proportional to the sensory stimulus" (p. 5). Finally, when assessing symmetry, "the pattern, sequence, speed, and intensity of the response should be the same on both sides of the body" (p. 5).

## **Appendix P**

### **Approval of Doctoral Dissertation Proposal**



**PhD in Health Sciences**

**DISSERTATION PROPOSAL HEARING FORM**

**DOCTORAL CANDIDATE'S NAME:** Jerzie-Ann Coppola

**PROJECT TITLE:** "Exploring MNRI® Core Specialists' Research Knowledge, Attitude, and Practice"

**PROPOSAL HEARING DATE:** December 9, 2020

**I HAVE PARTICIPATED IN THE ABOVE-NAMED STUDENT'S PROPOSAL HEARING AND MY SIGNATURE PROVIDES SUPPORT OF THE PROPOSED METHODOLOGY.**

**DISSERT. COMMITTEE CHAIR:** Deborah A. DeLuca

**COMMITTEE MEMBER SIGNATURE:** 

**DISSERT. COMMITTEE MEMBER:** Genevieve Pinto Zipp

**COMMITTEE MEMBER SIGNATURE:** 

**DISSERT. COMMITTEE MEMBER:** Michelle D'Abundo

**COMMITTEE MEMBER SIGNATURE:** 