Integrating the International Classification of Functioning, Disability, and Health Model into Massage Therapy Research, Education, and Practice

Niki Munk, BA, LMT,[1] Anne Harrison, PT, PhD[1,2]

[1]Gerontology Department, College of Public Health, and [2]Department of Rehabilitation Sciences, College of Health Sciences, University of Kentucky, KY, USA

Without an increase in clearly defined and clinically significant outcomes research in massage therapy (MT), the practice is in jeopardy of remaining on the fringes of accepted and utilized therapeutic care. This reality will slow the integration of MT into routine preventive, rehabilitative, curative, and supportive care. The International Classification of Functioning, Disability, and Health (ICF) developed by the World Health Organization is a comprehensive model of functioning and disability that provides a universal taxonomy of human functioning that is recognized globally. Integration of the ICF model into MT research, education, and practice would provide a foundation for a common language, particularly in regard to examining outcomes of MT.

Here, we review the dynamic and respected ICF model as it applies to massage research, outcomes dissemination, education, and practice, with these specific objectives:

- **To describe the specific domains of the ICF model**
- **To apply the described ICF domains to current massage practice and research**
- **To discuss how integration of the ICF model enhances communication and translation among those within and to those outside the MT field**

The ICF model is ideal for application to MT interests because it works outside the typical focus on pathology or a specific organ system. Instead, the ICF focuses on impairment or limitations in *functioning* associated with health conditions. The ICF also highlights and incorporates the complex interactions of environment and personal factors and the impact that those factors exert on the domains of body structure, activity, and participation. This interaction has unique implications for MT practitioners, researchers, and clients/patients. Furthermore, the ICF model provides a framework for classifying outcomes, which is a critical aspect of clinical research.

KEYWORDS: Translational research, methodology, clinical research

INTRODUCTION

The field of massage therapy (MT) is on the cusp of acceptance into mainstream health practices. However, without clearly defined and clinically significant outcomes research in MT, the practice is in jeopardy of remaining on the fringes of accepted therapeutic care, with its integration into routine preventive, rehabilitative, curative, and supportive care slowed[(1)]. To answer important research questions, a common language and an organizational model must be integrated into the foundation of the field to facilitate communication and translation among researchers, practitioners, educators, clients, and other health professionals. Indeed, the need for translational research in the MT field was a topic of interest and the focus of a panel discussion at the recent Highlighting Massage Therapy in CIM Research conference (Hymel GM, Chaitow L, moderators. Translating research into practice and practice into research. Panel discussion at the Highlighting Massage Therapy in CIM Research; Seattle, WA, USA; May 13–15, 2010).

The *International Classification of Functioning, Disability, and Health* (ICF), developed by the World Health Organization[(2)], is a comprehensive model of function and disability (Figure 1) that provides a universal taxonomy for human functioning. The

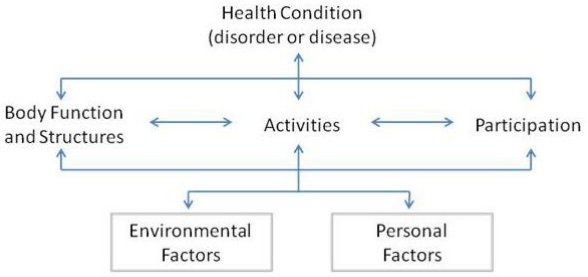

Figure 1. The International Classification of Functioning, Disability, and Health (ICF) model[(2)]: mapping the dynamic relationship between model components.

ICF model is used around the world by a variety of rehabilitation and medical professionals to provide common ground[1]. Integration of the ICF model into MT research, education, and practice would support translational research by providing a framework for the discussion of clinical reasoning, treatment development, and clinical relevance of outcomes experienced by the recipients of MT.

The present paper introduces an adaptable and respected model applicable to massage research design, research dissemination, education, and practice. As authors, our objectives are

- to describe the specific domains of the ICF model,
- to apply the described ICF domains to current MT practice and research, and
- to discuss how integration of the ICF model enhances communication and translation among those within and to those outside the massage field.

Setting the Context

Massage practitioners, researchers, and educators have a great deal to contribute to one another[3], but collaborations among these groups are difficult to establish and maintain. The interaction of massage practitioners with other health care providers is also challenging, in part because of issues related to lack of a common language. Those issues are intensified by the fact that a foundational model of massage practice does not currently exist. These realities contribute to the many challenges of developing a scientific foundation for the field, which in turn exacerbate the perception of many health professionals that MT is not "mainstream." Some disregard MT as a viable treatment altogether.

An often overlooked fact is that, historically, MT was a part of orthodox medicine and was frequently practiced by doctors and nurses in the late 19th and early 20th centuries[4]. With advances in practice and technology in physiotherapy after World War II, massage fell out of use, not because it was ineffective or inappropriate, but rather because it was labor-intensive[4]. A consideration of this aspect of the history of massage is important, because it indicates that, at one time, practitioners of massage and providers of primary health care communicated through a common language and model of practice that encompassed assessment, treatment development, treatment application, and evaluation. The decline of MT in US mainstream medical practice contributed to the fissure in philosophy and taxonomy between massage and the medical community as nonmedical professionals took up the practice and applied it to the construct of wellness from a holistic, yet not necessarily evidence-based, perspective.

As the evidence base for MT builds in the literature, a foundational model that standardizes language among massage practitioners and medical care providers may facilitate the re-integration of massage into mainstream health care. Such a model (see Figure 2) also provides a common language of assessment, treatment plan development, outcomes, and clinical significance for MT practitioners, educators, and researchers. Currently, the lack of such constructs[5] hinders progress toward translational research in the field.

Looking to other practices that have some philosophical common ground with therapeutic massage is helpful in identifying established models used in the medical community. Essentially, by adopting such a model, those in the massage field can make use of and conform to an accepted and generalizable approach to care. A concern for those in the massage field is that, to be appropriate, the model would have to preserve the holistic perspective that MT enjoys. The ICF model provides just such an approach and is used throughout the world in rehabilitation medicine[1].

Over the past 40 years, models for disability have been developed and refined, with each model varying from the others in terminology, definitions, and dynamics. Most models include the four components considered the pathway to disability (Figure 3): pathology, impairment, functional limitation, and disability. If pathology or dysfunction is not interrupted, progression to impairment may occur. Accordingly, if impairment is allowed to progress, functional limitation may occur, which if not interrupted, can progress to disability. In acknowledgment of the fact that progress is not always unidirectional, some of the earlier disability models included bidirectional arrows to indicate the interactive nature of the domains. Some members of the MT field are familiar with the logical approach that such disability models represent because the World Health Organization's *International Classification of Disease* (ICD) codes originate from that model and that approach to health. But while the ICD model focuses on disease, the ICF model is called a "participation model" because it focuses on *function* rather than on disease. The ICF framework considers impairments in body functions and systems in relation to the activities that are restricted, and how those restrictions, as a whole, influence a person's participation in life. Unlike the ICD model, the ICF model recognizes that two people with the same pathology or ailment can have substantially different outcomes. These features of the ICF model make it an ideal framework for adoption into the MT field.

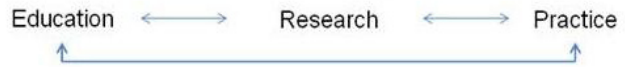

Figure 2. Ideal communication and translation model for the massage therapy field.

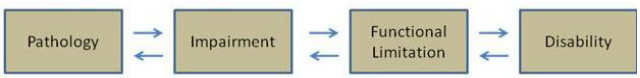

Figure 3. Basic framework for disability models.

ICF MODEL OVERVIEW

The ICF serves as a map (Figure 1) describing the interactive and evolutionary process of an individual's journey toward meaningful life participation after the onset of a challenging health condition[2]. The three-tier ICF model has several components, beginning, at the top, with the health condition, disorder, or disease, which affects components at the second tier to varying degrees. The major functional domains that constitute the series of ICF constructs at that second tier are body function and structures, activity, and participation. The contextual aspects of the ICF—specifically, environmental and personal factors—are located on the third tier of the model.

The Body Function and Structures Domain

The body function and structures domain encompasses not only the affected anatomical areas of the body, but also physiological aspects of the systems or body areas affected. This domain essentially describes the impairment experienced at the physical level because of the health condition or disease. For example, if a person experiences an ankle fracture (health condition/disease), impairments under the body function and structures domain might include swelling and pain, sensory loss, ligament or tendon sprain, muscle guarding, and reductions in strength and range of motion (ROM). These are all characteristics that are considered during assessment, treatment plan development, treatment application, and outcomes assessment in the MT field. The impairments alone do not provide specific information about the person's ability to perform particular activities or to participate in meaningful life functions.

The Activities Domain

Impairments in body function and structures may affect activities such as walking, running, jumping, reaching, and turning (the second ICF domain). The relationship between activities and body function and structures can be bidirectional. In the earlier example of an ankle fracture, the person with the fracture will, for instance, have difficulty returning to playing a sport (participation) after the fracture heals unless that person can run and jump (activities) without experiencing pain and swelling (body function impairments). If appropriate progress in rehabilitation fails to occur, activity limitations may actually exacerbate body function impairments, thus contributing to further weakness and loss of ROM.

The Participation Domain

The final domain in the ICF model is participation. It is easy to confuse "activity" and "participation," but they are usually discernible. "Participation" is an activity with meaning and relevance for the person performing it. Rather than considering just the act of standing up (an activity), "participation" encompasses standing up to leave a restaurant, stepping into and out of a car at the shopping mall, rising from a fall at home, or transferring on and off the toilet at home. Returning once again to the earlier example, evaluation of participation considers the extent to which the person returns to meaningful activities such as hobbies, sports, working, shopping, and driving.

The interaction between activities and participation is also bidirectional in nature. The effect of activities on participation has already been described, but participation can also affect activities and, in turn, body function and structures. An individual structure may heal, and the ability to perform activities may return, but if the individual does not then participate in normal meaningful activities (even though they are capable of doing so), their ability to perform certain activities may decrease or disappear. A participation restriction (self-imposed or otherwise) can result in an activity limitation (for example, inability to run, jump, walk) and in impairments of body function and structures (for example, reduced strength, increased stiffness, swelling).

Contextual Factors

The example of an ankle fracture demonstrates the utility of the ICF model for mapping the dynamic process of function in relation to a particular condition. At the same time, it encompasses constructs that are meaningful to researchers, practitioners, and clients/patients. But to present a complete picture of issues that influence an individual's functional participation, consideration must also be given to the contextual components included in the ICF model: environmental and personal factors. These contextual factors present the "rest of the story" (background) to the person's life and living[2] that influences the functional domains within the context of the health condition being experienced.

"Environmental factors" can be subdivided into individual factors (the features and interactions present in a person's immediate living, working, and socializing environment) and societal factors (the formal and informal rules or laws, social structures, and available services and support in the person's living or working environments, community, or society)[2]. Environmental factors greatly influence the extent to which a health condition affects the person's ability to perform activities or to participate in life. For example, a person who has limited range of arm motion and whose employment does not require reaching overhead or lifting heavy objects may not experience limitations in the work environment because of the impairment. A different individual with the same condition whose job does require overhead lifting of heavy objects will be severely limited in

work performance. That individual may, by contrast, be considered disabled.

Personal factors constitute the second contextual factor type in the ICF model. These individual background characteristics are not considered to be a part of the health condition of interest[2]. Examples of these characteristics include sex, race, age, socioeconomic status, fitness, habits, coping styles, education, comorbidities, social background, past and current events, and behavior patterns. These important contextual factors are included in the ICF model because of the potential effects that some or all of them have on various outcomes[2]. For example, socioeconomic status is known to be an important factor in health outcomes[6], habits related to physical activity influence many aspects of health and functional ability[7,8], and depression presents a challenging barrier to participation for many people[9,10].

THE ICF MODEL AS A FRAMEWORK FOR THE MT FIELD

The fluidity of the ICF model reflects true-to-life interactions witnessed by massage therapists on a regular basis and is ideal for application to MT practice and research because it works broadly and not just within the confines of pathology or specific organ systems. Like MT, the ICF model works within the construct of impairment or the *functional* limitations associated with health conditions. In providing a framework to examine not only physical functioning, but also emotional and cognitive functioning, the ICF model facilitates communication about outcomes of interest in all of these areas, which is important because massage therapists are typically interested in the effect of massage on all of these complex and intersecting domains. Furthermore, the inclusion in the ICF model of personal and environmental contextual factors enhances its appropriateness for integration into MT research, practice, and education: participants in the field are particularly sensitive to the effects that environmental and personal factors have on treatment effectiveness. The ICF model provides such a conceptual framework and also provides a common language for use by MT researchers, practitioners, and educators, and by other health care researchers and professionals.

The question now becomes how to apply the ICF model to MT outcomes research and practice. In the examples that follow, we discuss two health conditions, arthritis and back pain, to demonstrate how the ICF model can provide an assessment framework for researchers and practitioners of MT.

Example 1: Arthritis

Massage has been used to manage arthritis pain[11], which may be of particular interest to those who deal primarily with older adults. Although an examination of arthritis from a disease model perspective is intuitively appealing because of the obvious linkage between arthritis pathology and functional restriction and disability, such a focus fails to recognize the fluctuating nature of a condition that is managed rather than cured, and that can affect an individual to varying degrees over an extended period of time. These individual complexities of arthritis make it an ideal example for framing with the ICF model. Figure 4 depicts potential MT outcomes of interest for each of the ICF's primary domains, together with examples of appropriate assessments for those outcomes in massage recipients with arthritis.

The Body Function and Structures Domain

Outcome measures of interest in the body function and structures domain are those that relate to the actual body area or areas affected, their ability to perform, and the quality of the performance of normal movement and function. Pertinent outcomes that massage researchers and practitioners may be interested in examining for arthritis are pain and strength. The McGill Pain Questionnaire[12] is a standardized assessment tool used in many studies, including those that investigate MT. However, simpler tools such as visual analog scales (a faces scale or a pain thermometer) may be more appropriate for assessing pain in older adults[13].

As an assessment, use of a handgrip and pinch dynamometer to measure hand and finger strength may be appropriate[14]. This approach was used in a recent MT research study investigating the efficacy of massage for symptoms associated with carpal tunnel syndrome (rather than hand and finger strength in arthritis)[15]. In that study, those measurements were found to be sensitive to change after MT treatment.

The Activities Domain

As would be expected, activity measures for people with arthritis are an excellent way to determine the extent to which condition affects physical function.

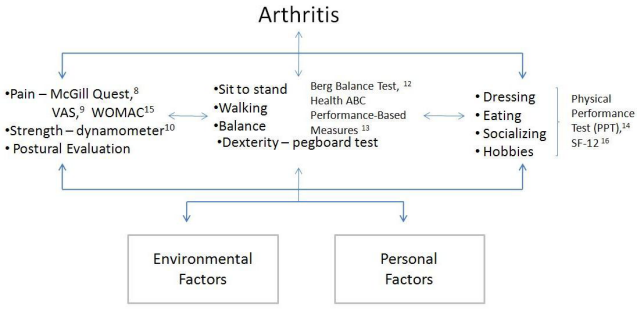

FIGURE 4. An International Classification of Functioning, Disability, and Health (ICF) model for example 1: arthritis in an older adult. McGill Quest = McGill Pain Questionnaire; VAS = visual analog scale; WOMAC = Western Ontario McMasters Questionnaire.

In the ICF activities domain, the outcome measures of interest for those in the MT field are those that reflect how the disease attacks joints essential for movement. They include timed sit-to-stand, timed walking, and balance or dexterity measures. Outcomes can be measured using self-report questionnaires or performance-based observational assessments. Many assessment tools are available to measure individual outcomes of interest (for example, the Berg Balance Test[16]); others assess several activities (for example, the Health ABC Performance-Based Measure[17]).

The Participation Domain

Outcome measures of interest in the participation domain assess activities with meaning, such as activities of daily living or social activities. Massage professionals are particularly interested in these aspects, because clients/patients typically see a return to participation as the most important outcome. Examples of tools that assess participation are the Physical Performance Test[18], the Western Ontario McMasters Questionnaire (WOMAC)[19], and the 12-question Short-Form Health Survey[20]. Notably, instruments such as the WOMAC and the Physical Performance Test include effective and efficient assessments of both the activities domain and the participation domain; in the case of the WOMAC, even the body function and structures domain is measured.

Contextual Factors

Contextual factors affect outcomes and are important to consider in MT research and practice. In research studies, personal contextual factors such as age, sex, anthropomorphic details, and comorbidities should be gathered to accurately characterize the sample and for consideration as confounding variables in the analysis. From a practitioner perspective, personal contextual factors may also influence assessment and treatment development, application, and effectiveness. Personal factors such as depression can be cursorily screened for using instruments such as the Beck Depression Inventory[21] or the Geriatric Depression Scale[22].

In addition, environmental factors may provide insight into the development or exacerbation of a condition and may also influence the effectiveness of the MT intervention. For example, if MT intervention is being applied in an individual experiencing wrist and hand osteoarthritis, equipment used repetitively in work or leisure will play a key role in the effectiveness of the intervention. Exclusion of this environmental information may prevent effective treatment from being realized.

Example 2: Back Pain

Back pain is a familiar issue in the massage field, and it has received abundant focus in recent research[23]. In Figure 5, the ICF model delineates outcomes of interest in back pain for those in the MT field. Although the list is not exhaustive, each domain contains several appropriate examples of outcomes of interest. Figure 6 shows potential assessment tools for examining back pain within the ICF framework[12–13,16,24–31].

The Body Function and Structures Domain

As with arthritis, back pain in the body function and structures domain includes impairments such as ROM, strength, posture, and pain level. Practitioners and educators in MT routinely consider these factors during intake, in the "S" part of the SOAP (subjective, objective, assessment, plan) documentation process. Researchers are particularly interested in potential biomarkers for pain. Although cortisol[32] and substance P[33] have been examined as biomarkers, no validated or standardized surrogate yet exists for pain assessment, including assessment for back pain. Thus, a perfect biomarker or proxy for pain has yet to be established in the literature. This lack, combined with the subjective nature of pain, makes precise quantification of pain and its relief a difficult task. Back pain is therefore an ideal example to use when discussing the ICF model as a framework: with this issue, a more complete picture is gleaned with *function* rather than *condition* as the focus.

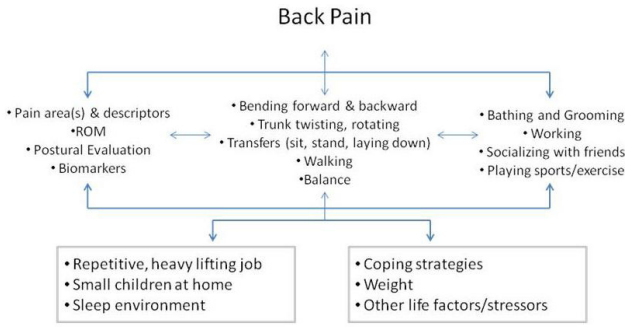

Figure 5. An International Classification of Functioning, Disability, and Health (ICF) model framework for a consideration of outcomes *relevant in back pain. ROM = range of motion.*

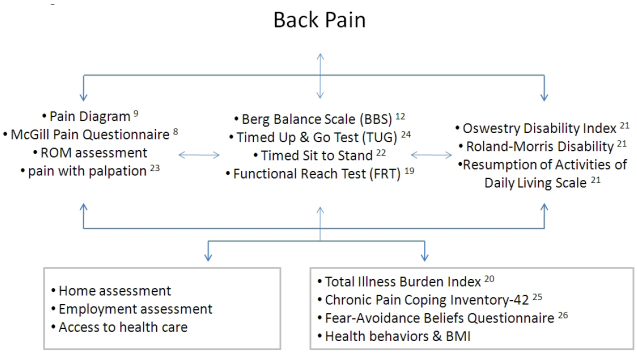

Figure 6. An International Classification of Functioning, Disability, and Health (ICF) model framework for a consideration of measures for outcomes *relevant in back pain. ROM = range of motion; BMI = body mass index.*

The Activities Domain

The effects of back pain on the activities domain are influenced by the anatomical or physiological causes of the condition. Conversely, limitations in particular activities are often used to inform development of the physiological treatment plan. The client with back pain who visits a massage therapist may be asked to bend slowly left or right until pain is felt. The therapist may also ask for a demonstration of the movements or positions that make the pain go away. By examining performance of these activities, the therapist gleans clues about how to direct treatment. This examination of activity is an example of how actual MT practice mirrors and complements the ICF model.

Figure 5 suggests several factors that are appropriate to consider in the ICF activities domain with regard to back pain, including bending, twisting, transferring, and walking. Balance is a consideration that, depending on the condition, could fit either into the body function and structures domain or the activities domain. For our purposes here, balance is not a descriptor of the condition itself, but rather an activity—the act of being balanced—that can be altered because of back pain. Figure 6 outlines several examples of valid and reliable measures to assess the foregoing activities; all are accessible to, and reasonable for use by, MT practitioners and researchers.

The Participation Domain

The participation domain tends to be the most important for patients/clients with regard to outcome, because it reflects their ability to live life and to participate in activities that have meaning for them. Figure 5 gives several examples of activities with meaning that are included in the participation domain. Figure 6 identifies measures that could be used in outcome assessments. Clients commonly discuss participation with their massage therapists. People may seek massage not only to address back pain, but also because of an inability to work or to play with their children. The client and therapist may agree that, in addition to pain relief, the therapeutic goals for the treatment plan include a return to work and the ability to play with the children.

At this point it is easy to think that the body function and structures domain and the participation domain are the two most important domains in the ICF model, and that the activities domain may not be applicable or becomes "just an extra step" for consideration in the MT field. But a focus on the former domains alone would be detrimental. Like pain, the performance of particular activities that have meaning ("participation") is subjective and difficult to quantify. The activities domain provides an important opportunity to assess *demonstrated* abilities, highlighting circumstances in which a person may be physically able to perform the activities needed for meaningful life participation, but is choosing not to participate for other reasons—a situation in which participation measures will not provide an accurate picture of physical abilities.

Measurement of physical performance in an activity is an important functional domain, but different from the domain of self-reported participation. For example, upon examination, a client may be able to climb stairs, but may report not doing so in the "real world." Measures from the activities domain are fairly common in the research literature and have been used to predict important future outcomes such as further functional decline, institutionalization, or death.

Contextual Factors

If a condition or treatment effectiveness is assessed without a consideration of personal and environmental factors, issues that exacerbate the condition may persist, reducing the effectiveness of treatments. In research, factors such as depression and self-efficacy are often used either to group patients or to include and exclude subjects from a study. From a practitioner's standpoint, these factors provide potential discussion points related to collaborations with other health care providers such as mental health counselors. Environmental factors such as the client's work or sleep environment can be used to develop a home program whose goals are to change sleep patterns or to improve the ergonomics of the work environment. Figures 5 and 6 provide examples of, and measurements for, environmental and personal contextual factors that are pertinent to back pain.

THE ICF MODEL AND TRANSLATIONAL MASSAGE RESEARCH

The ICF model provides an organized and detailed structure that researchers can use to examine outcomes of the holistic approach already commonly used by MT practitioners when evaluating and treating clients. Considering the complexities of the examples provided, it is unrealistic to expect a research trial—let alone a single practitioner—to include all, or even many, of the sample measures in a single study or treatment evaluation. We simply propose that researchers and practitioners who use the ICF model as a framework for study design and outcomes dissemination will be better equipped to convey their findings, and the importance thereof, to a broad audience.

The ICF model particularly supports translational research, allowing researchers and practitioners to focus more fully on specific domains while integrating, or at least acknowledging, the influence of other domains. A translational research team that focuses on outcomes related to physiological, functional, and psychosocial factors can easily be framed within the ICF model. Even if only a single domain is assessed

in a particular study, the limitations posed by the other domains and the potential relationships between them provide a platform for discussion and open the door to future research. Use of the ICF model also facilitates effective dialogue between and among therapists and researchers.

In providing a framework for bench-to-bedside (or "cell-to-society") research, the ICF model also facilitates a "So what?" dialogue. For example, so what if the ROM in an older adult's shoulder improves? The answer is important because of the relationship of ROM with the ability to perform particular activities such as lifting the arm above the head. That physical ability is, in turn, related to an ability to participate in activities with meaning such as dressing, grooming, or hobbies, which are important for quality of, and engagement with, life; which allow an individual to live independently and to age in place; which are important for policymakers, because older adults living independently or aging in place equate to lower health care costs ... and so on, and so on. It can be challenging for professionals filling various roles in the MT field to understand the implications or importance of one another's work. Use of the ICF framework can reduce the tendency for implications and relevance to be "lost in translation" during dialogue involving professionals from various areas.

Consideration of the ICF model in the development of research questions can also support translational research. For example, general research questions may include "Which contextual factors mediate the relationship between activity performance and participation," or "Which variables in body structure and function converge to reduce the ability to perform a particular activity?" In a massage study, researchers may examine whether patient attitudes toward MT or previous massage experience (contextual factors) affect outcomes. Researchers may examine whether MT is effective on pegboard dexterity tests in older adults with arthritis and decreased wrist and finger ROM. More-specific research questions may include "Does increased ROM after MT result in increased participation," or "Does combining MT with physical therapy after hip replacement increase participation?" Questions such as these can easily incorporate all aspects of the ICF model, allowing relevance and significance to translate to various subgroups of interest.

The benefits from applying the ICF model are not just relevant to massage research and practice. The ICF model can be used as a framework to connect dialogue for all three aspects of the MT field: research, practice, *and* education (Figure 7). Use of the ICF model as a foundation for teaching MT would support the development of the critical and clinical thinking skills that make for effective practitioners. If MT students are taught this model, critical thinking skills will be cultivated and used from the beginning of their careers, allowing them to apply meaningful constructs to client assessment, clinical decision-making, outcomes

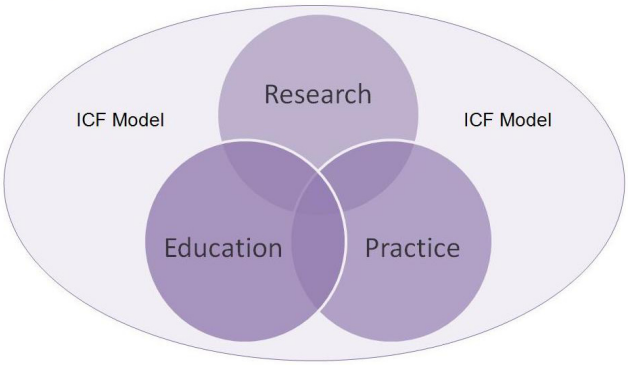

Figure 7. The International Classification of Functioning, Disability, and Health (ICF) supports intra-field communication and also translational research.

examination, and therapeutic significance. This approach has the additional potential to create more versatility, with new therapist skill sets, particularly an ability to relate their work interprofessionally.

CONCLUSIONS

Adoption of the ICF model of health and function in the MT field could be an effective first step in addressing the need for effective communication within and outside the field. The ICF model is a good choice for implementation in the MT field because it reflects realistic MT assessment and treatment. In addition, the ICF is a model of function that is already used and respected throughout the world. The ICF model framework has the potential to facilitate MT research development and dissemination and to act as a communications bridge to other health care fields and practitioners.

CONFLICT OF INTEREST NOTIFICATION

The authors declare that there are no conflicts of interest.

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Corresponding author: Niki Munk, University of Kentucky, 900 S Limestone, 304B Wethington Health Sciences Building, Lexington, KY 40536 USA.
E-mail: Niki.Munk@uky.edu