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Bridging Indigenous and Western Sciences: Research Methodologies for Traditional, Complementary, and Alternative Medicine Systems

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Abstract

Emergent research methodologies congruent with Indigenous knowledge and worldviews are providing access to insights from traditional, complementary, and alternative medicine, including Indigenous healing systems. Tension is evident for researchers balancing representation of Indigenous realities with expectation to conform to the conventionality and rationality of "acceptable" Western science–based research protocols. Where past research pursuits have been limited by polarized views of legitimacy and validity, Western science and Indigenous science are now converging as equally valid notions of science to guide emergent research practices such as Kaupapa Māori. This narrative synthesis explores complex relations between epistemology, methodology, and practice. It aims to contribute to the transfer of knowledge between Indigenous and Western scientific paradigms.

Keywords

epistemology, methodology, research paradigms, TCAM, Indigenous science, narrative synthesis

Introduction

Research methodologies for the exploration of traditional, complementary, and alternative medicines (TCAM) are developing in ways congruent with Indigenous science and traditional knowledge systems. These emergent research approaches are not necessarily exclusive of Western scientifically oriented methods (Jones, Ingham, Cram, Dean, & Davies, 2013; Te Karu, Bryant, & Elley, 2013). They do, however, require adaptation and interrogation of methodological impact upon participants and Indigenous peoples (Durie, 2004). Effective application of integrated methodologies requires consideration of cultural sensitivity and cross-cultural reliability for the reconciliation of academic research priorities with diverse participant realities (Saini, 2012). Tension is evident for researchers balancing representation of participants' realities and the need to conform to conventionality and rationality of "acceptable" Western science–based research protocols (Ahuriri-Driscoll, 2014; Ritenbaugh et al., 2008). The power embedded in the underlying philosophy of research methodologies must be acknowledged (Carr, 2002). Furthermore, if comparisons are to be made between health systems grounded in divergent worldviews, with contrasting definitions of well-being (Connor, 2012), researchers must possess expertise in the system being studied as well as in the research methods being applied (Durie, 2004).

The potential for revelation of insights from TCAM and Indigenous knowledge systems is being limited by polarized views of legitimacy and validity between research paradigms (Durie, 2004; Murthy, 2010). Applying Western scientific "rules" of research can act as a control mechanism and risk the assimilation of traditional knowledge, under the guise of facilitating "legitimate" discourse (Saini, 2012). Indigenous science provides empirical evidence, gathered over the centuries and sustained by oral or codified traditions, that is already available to look to for insights (Winkelman, 2009). Literature included in this synthesis indicates recent research in TCAM, and Indigenous healing is less interested in finding new information. Rather, it seeks to validate what those systems already know and to translate that knowledge into language and measures that can be understood according to Western science (Chacko, 2003; Joshi, 2004).

TCAM encompasses knowledge of healing systems from around the globe, including Indigenous medicine traditions (Hollenburg, Zakus, Cook, & Xu, 2008). These healing systems

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provide ancient and living knowledge of therapeutic strategies for health based on the experiences of culturally or geographically defined groups. Examples include Ayurveda and yoga, the traditional healing systems of India, and traditional Chinese medicine (TCM) (Patwardhan, Warude, Pushpangadan, & Bhatt, 2005). Indigenous healing systems have roots in various Indigenous cultures (Winkelman, 2009). Although they share TCAM classification (Hollenburg et al., 2008), Indigenous medicine systems are uniquely characterized by oral traditions, distinct languages, the importance of community, and the view that human health is interconnected with the earth (Robbins & Dewar, 2011). The example included in this article is Rongoa Māori, traditional Māori medicine in Aotearoa, New Zealand (McGowan, 2009). In many places around the globe, TCAM remain the most accessible systems of health care. Although the biomedical system is dominant in New Zealand and other colonized, Westernized countries, TCAM coexist—even though biomedicine has questioned and, in some cases, discounted their efficacy. The resultant state of medical pluralism is common to modern societies (Winkelman, 2009).

The role of research in TCAM, including Indigenous healing traditions, is debated (Durie, 2004; Coulter, Lewith, Khorsan, Kirk, & Mittman, 2014; Shukla & Gardner, 2006). With increasing rates of acceptance and use (Coulter et al., 2014; Kumar, Bajaj, & Mehrotra, 2006), research validating effectiveness and safety of TCAM is important. Not only does it assure the protection of its users, it also holds potential to reveal greater knowledge and resources for health. The question for researchers is how to *both* evaluate evidence of healing capacity and access the fullest meaning of data gathered from distinct worldviews (Coulter et al., 2014).

This article explores the interface between TCAM and Western science, with a narrative synthesis of emergent and Indigenous research approaches for the investigation of whole systems of healing. This narrative synthesis works to bridge discourses by demonstrating the potentiality, applicability, and credibility of research methodologies representative of distinct worldviews. It acts as yet another strand in the weaving of knowledge across typical discipline and sector boundaries (Chacko, 2003). Ultimately, this synthesis aims to make a contribution to the transfer of knowledge between Indigenous and Western scientific paradigms (Saini, 2012) for the enrichment of health practices and greater choice in health care.

Background

"Research is methodology." Methodology guides the way research questions are applied in the field, allowing the researcher to make statements about the significance of results or outcomes (Clough & Nutbrown, 2002). Methodology, therefore, provides the rationale for methods used to produce "valid" knowledge. Knowledge is considered valid only if it is produced in ways conforming to methods prescribed by a chosen research methodology. Methodology claims a knowledge of its own in asserting certain procedures. An aptly selected methodology will justify decisions of the researcher and prove necessity of researcher actions. While research methods are justified by the methodology, the methodology is justified by an underlying philosophy. Access to the functions of methodology, from conception of research questions to drawing of conclusions, is provided by exploration of relationships between the methodology's philosophy and the researched subject. There is immense power in the philosophy of methodology that is assumed superior in its ability to judge and validate claims to truth made by the research subject (Carr, 2002). Truth is an ever-evolving creation (Cajete, 2004). To look beyond current knowledge, a researcher must develop capacity to see their subject through different lenses. This is the place for new methodology, seeking not only evidence but also meaning from the data (Clough & Nutbrown, 2002).

In its broadest sense, the Latin root of science, *scientia*, means knowledge. The term *Western science* has been used with a degree of exclusivity since the 20th century to refer to officially sanctioned knowledge of positivist inquiry, supported and acknowledged by governing bodies. As a dominant, global system of knowledge, Western science has served as a basis for research investigating efficacy and effectiveness of health care, including Indigenous and TCAM healing practices. Aspects of knowledge from Indigenous healing and traditional medicine systems may conflict with the rationale of Western science or may be misunderstood in codified or highly metaphoric oral information systems. But that does not make this knowledge unscientific. Rather, it makes it scientific knowledge of a different kind (Snively & Corsiglia, 1998). Indigenous science is empirical knowledge founded in processes of revelation, traditional teachings, and empirical observation in real-life settings over time (Lavallee, 2009). Snively and Corsiglia (1998) defined Indigenous science as relative to both scientific knowledge of long-time resident, usually oral-culture, populations (as in Indigenous healing traditions), *and* scientific knowledge of persons within a society, affected by the interests and worldviews of their own community (as in TCAM). Traditional ecological knowledge is a richly documented example of Indigenous science. It also serves as an example of an Indigenous science being "rediscovered" by Western science researchers, looking to traditional local knowledge which Western Science claims to legitimize, in endeavors such as bioprospecting (Battiste & Henderson, 2000). Binary discussions of Western science and Indigenous science are now converging as significant Indigenous knowledge is transcribed and acknowledged as equally valid according to relativist, rather than universal, notions of science (Snively & Corsiglia, 2001).

Nonetheless, the application of research methodologies in concordance with Western scientific criteria can lead researchers to draw conclusions according to Eurocentric scientific

thinking. Indigenous and culturally derived traditional knowledge has its own distinct philosophies and understandings of health. Rationalization of this knowledge for coincidence with Western scientific principles is taking data out of its true context, rendering it meaningless in the absence of the overarching principles of knowledge. Indigenous knowledge cannot be sufficiently assessed by Western scientific criteria alone (Durie, 2004). Tuhiwai-Smith (1999) identified Indigenous research as a site of struggle between Indigenous knowing and Western interests. Tuhiwai-Smith (1999) further noted injustices of colonization and research for their significant impacts upon Indigenous populations, regulating and realizing an underlying code of imperialism with scientific paradigms, scholarly disciplines, and the individuals and institutions supporting them. It is significant to acknowledge that practices that constitute folk medicine in one society may in fact represent professional practice in another, according to differences in local power structures (Winkelman, 2009).

Considerable numbers of people use complementary and alternative medicine (CAM) in both developing and developed nations, many of them well educated (Chacko, 2003; Winkelman, 2009). As attitudes are changing so too health services are changing. At one time competing and marginalized, doctors are now training in modalities such as acupuncture and herbal medicine; holistic health professionals are integrating use of stethoscopes and practicing alongside medical practitioners; and, Indigenous frameworks are being introduced for provision of more holistic, culturally competent care. Thus, the distinction between biomedical and complementary health sectors is no longer absolute (Winkelman, 2009).

There are calls for further scientific research documenting clinical evidence of efficacy to support access to and utilization of complementary and alternative practices alongside biomedical practices (Wellcome Trust, 2000). There is also already a multitude of other information sources providing "clinical" evidence already in existence; for example, identifiable patterns in long-standing traditional use, similar applications in various areas of the world, and congruencies found between pharmacological, biomedical properties of healing agents, and the pathophysiology of disease (Winkelman, 2009). The development of research methodologies can support a fuller understanding of TCAM and Indigenous practices as whole systems of healing and the place for these modalities in provision of modern health services.

Objectives

This article presents a narrative synthesis that identifies and compares methodologies used in the evaluation of traditional healing practices. In considering the aim(s), suitability, and validity of each approach, contributions can be made to the interpretation of research findings for maximum receptivity to learnings brought to light in a meeting ground between two distinct worldviews (Popay et al., 2006).

Method of Synthesis

Following the protocol guidance of Popay and colleagues (2006), this article provides a narrative synthesis of articles applying either or both Indigenous and Western research methodologies to evaluate effectiveness of various healing approaches. From the synthesis, this article also considers the potential for transference of findings between knowledge systems.

Popay and colleagues (2006) described narrative synthesis as a form of trustworthy story telling. Just as story telling is central to the sustaining and transmission of knowledge among Indigenous cultures, the nature of this narrative synthesis aims to bring evidence together to tell a story about long-established practices and newly determining research approaches for the sharing of knowledge that can enrich health systems and health care practices.

Four main elements of a narrative synthesis detailed in the general framework provided by Popay and colleagues (2006) and relevant to this research involve theorizing how, why, and for whom certain research methodologies work; organizing a preliminary synthesis of research findings; looking for relationships within the data; and assessing the robustness of the data and the data synthesis. First, the lead author surveyed studies considering whether or not the research interventions achieved objectives, for whom they were effective, and why they may have been effective. This initial survey of the data enabled selection of studies utilizing a range of methodologies and preliminary assessment of applicability for this narrative synthesis. Next, factors seen to be facilitating research implementation or acting as barriers in implementation were identified and organized thematically for further exploration. These relationships in the data were then investigated to understand why and how the research was undertaken and why the interventions had an effect, if any. Findings have been expanded upon for generalizability and relevance in different contexts.

Appropriately, the protocol for narrative synthesis does not rely upon any one authoritative system of knowledge or rigorously tested techniques. However, as the Cochrane handbook (Higgins & Green, 2011) highlights, it is possible such a narrative approach to the synthesis of data may be prone to bias or generate unsound conclusions. These problems are not limited to narrative synthesis. Statistical techniques can equally produce misleading results and may also be reported with bias, as this synthesis later demonstrates. Somewhat aligned with the motivation for this synthesis, there is also a need for methodological strengthening of this narrative technique. The authors have aimed to address this need by way of application of Popay and colleagues' (2006) guidance.

Study Selection

A total of 14 articles were included in the primary synthesis and appraisal of research quality, considered together with extensive supplementary reading of background information and articles related to content of the studies. The retrieval strategy for studies to be included involved electronic bibliographic database searches of EMBASE and MEDLINE, generating 304 and 12 studies, respectively. The search returned articles reporting research in multifarious modalities broadly classified as CAM. Only those studies with specific reference to healing practices with Indigenous or cultural origins in long-established traditional knowledge systems were included. Acknowledging the diversity and depth of Indigenous and TCAM healing traditions, the authors have focused on four systems, including Rongoa, Ayurveda, yoga, and TCM. The selection of these systems is based on, and limited by, the authors' relevant training and familiarity with these traditional medicine systems. Further limits were applied to source articles using human participants, published since the year 2000, and reported in English language. The search criteria used for both databases was ([Complementary medicine or alternative medicine] or [traditional medicine or Indigenous medicine] or [integrative medicine]) AND ([qualitative research] or [quantitative study] or [methodology or mixed methods]) AND ([Ayurveda] or [yoga] or [Rongoa] or [Chinese medicine]). It was necessary to supplement these database searches with the use of Google Scholar to find research articles representative of Kaupapa Māori approaches. Resources from relevant websites, such as the World Health Organization and Association of Ayurvedic Professionals, and resources provided by University of Canterbury teaching staff were also examined for relevant content.

Each of the studies selected evaluates TCAM healing practices and/or the associated healing experience. Articles were chosen to represent diverse research methodologies utilizing either or both Indigenous scientific research designs and/or Western scientific research standards, making it possible to consider compatibility of methods and transfer of learnings between knowledge systems (Saini, 2012).

With methodological, observational, and analytical contributions from fields of anthropology, geography, biology, conservation, education, social science, history, and public and clinical health, the research reviewed in this article is evidence of the multidisciplinary expertise culminating in emergent methodologies for research in TCAM and Indigenous healing systems. Its relevance reaches far beyond health and political sectors. Its primary impact is upon the people to whom this knowledge belongs, the Indigenous communities of our world, and its potential impact is for the health of all people. The purpose and positionality of each research article is examined with reference to these wider perspectives. Certain characteristics of researchers' methodological choices are discussed, making explicit connections between methodological assumptions, relevance of data, and the obtaining of multiple meaning from the data (with use of interpretive analyses and researcher-led reporting).

Findings

Research Methodologies

A multiscience perspective (Ogawa, 1995) is valuable when considering suitability of research methodologies. With access to two systems of knowledge, researchers investigating TCAM, and especially Indigenous healing, must bridge any "divide" between Western scientific and Indigenous scientific paradigms (see "Background" section; Durie, 2004). Determining a valid research design is fundamental. At polar ends of the debate, the position of researchers trained in biomedical methodologies may consider knowledge as valid only when it is verified in a randomized double-blind, controlled trial. Whereas critics of biomedical methodologies maintain that evaluation of traditional medicines according to concepts of biomedicine may fail to produce true knowledge, owing to a dependence on scientific vocabulary and design criteria representative of imperialistic, Westernized ways of thinking (Tilburt & Kaptchuk, 2008). It may be significant to recognize many Indigenous people living in developed countries are already living in the divide, informed by both Western science and Indigenous science. There within may be the greatest opportunity for innovation: allowing each system its own integrity while developing research approaches that incorporate elements of both for maximum relevance and creation of new knowledge (Durie, 2004). Recent studies (Jones et al., 2013; Shukla & Gardner, 2006; Te Karu et al., 2013) reveal a new frame of thinking indicative of a coming together of Indigenous and Western scientific bodies of knowledge, sustaining credibility of both worldviews (Durie, 2004).

Western Science–Based Methodologies

The World Health Organization's (2002) First Global Strategy on Traditional and Alternative Medicine supports clinical research and evaluation of traditional medicine's efficacy in treating certain diseases while also acknowledging challenges of incomparable methodologies and terminologies. Comparative examination of health practices may be helpful in determining safety, efficacy, and cost-effectiveness of different treatments (Durie, 2004; Winkelman, 2009). Three of the studies included in this narrative synthesis used Western science–based randomized trials to evaluate Indigenous healing practices either exclusively, in comparison or combination with biomedical approaches. Although the chosen methodology is consistent, in actuality, there is variance in application of the methodology.

Kligler and colleagues (2011) assessed yoga as a complementary strategy in an integrative treatment for asthma among 154 adults (77 treatment, 77 control). Their randomized trial

evaluated combined effectiveness of an integrated, lifestyle-oriented treatment program in clinical status as well as quality of life (QoL). A double-blind control protocol was deemed impractical and unethical, making a rigorous study design a challenge. However the multicomponent treatment plan with lifestyle orientation was considered to have maximum applicability to the real-life experience of living with asthma. The results of this study are particularly noteworthy for the variance in outcomes between measures. Clinical testing of pulmonary function tests revealed no change. However, statistical analysis of the QoL survey showed both overall and disease-specific QoL improved significantly. These results indicate improvements are mediated by mechanisms not physiologically attributable to effects on airway inflammation (Kligler et al., 2011).

As the first clinical trial of its kind, Ritenbaugh et al. (2008) researched TCM as an individualized, whole system approach to treatment of temporomandibular joint disorders and compared outcomes with naturopathy and standard care options. Whole systems research aims to maintain theoretical congruency with the system of medicine being investigated. Treatments were not provided in isolation, rather within a framework that fostered development of health-enhancing behaviors, including dietary habits, exercise, and stress release practices. Subjective reports were quantified using linearly interpolated values. Standard care, naturopathy, and TCM groups all reported positive change, though TCM provided most effective pain relief. Divergent of the classical gold standard of the randomized controlled trial (RCT), the study was limited by sample size with 160 randomized patients, inconsistencies in treatment duration between groups, and changes made to reduce participant burden and provide rapid pain relief. However, as the first study of its kind, the authors are quick to point out the exploratory nature of the research and the greater importance of providing guidance for future studies as opposed to rigorous adherence to methodology.

In contrast, Macklin et al. (2006) focused exclusively on acupuncture, as an aspect of TCM. Macklin and colleagues (2006) emphasized soundness and validity of research based on a large sample size and rigorous adherence to both research methodology and TCM principles. Three groups were provided acupuncture treatment, using the following: acupuncture points individualized according to TCM diagnosis; preselected, standardized acupuncture points; or sham points not correlated with acupuncture points. Despite variable changes in blood pressure recorded for all groups throughout treatment duration, Macklin et al. (2006) reported no significant benefits for individualized or standardized treatment versus sham acupuncture. For all the reported validity of the methodology, the researcher's application does not fit with recent recommendations for study in the maturing field of acupuncture research, requiring either application of whole system interventions or a more mechanistic focus to understand how each treatment component translates into a physiological outcome (Langevin et al., 2011).

Indigenous Science–Based Methodologies

Indigenous research methodologies are predicated on the legitimacy and validity of Indigenous knowledge and philosophy, including language and culture (Tuhiwai-Smith, 1999). Beliefs of participants are not only protected, they are also endorsed in the research process (Durie, 2004). The application of Indigenous science for the conduction of research will necessarily vary according to local teachings and cultural traditions (Lavallee, 2009). At the heart of this research paradigm is connectedness and relationality, ensuring accountability of researchers and application of research outcomes for the good of those participating (Durie, 2004; Tuhiwai-Smith, 1999).

Kaupapa Māori is one such research approach (Jones et al., 2013; Te Karu et al., 2013). Māori are tangata whenua of Aotearoa, New Zealand (Health Research Council [HRC] of New Zealand, 2010). In accordance with Te Tiriti o Waitangi and in acknowledgment of disproportionately negative health and well-being statistics, Māori participation and prioritization in health research is critical (HRC of New Zealand, 2010). Kaupapa Māori research is affirming the genuine need to seek traditional knowledge as a way of understanding and as a basis for creative solution finding to the health crisis facing Māori today. It involves development of distinctively Māori philosophies and frameworks to inform academic work, which will in turn enhance Māori potentiality. Te Ao Māori (Māori worldview) and Te Reo (Māori language) possess a vast knowledge that can be drawn upon to effect change in health care and empowerment of Māori. Māori health organizations operating in community and iwi capacities already affirm the need to reclaim and more fully understand use of traditional healing (Reinfeld & Pihama, 2007). Application of Kaupapa Māori research methods can enhance the quality of research and outcomes, ensuring research contributes to Māori health development. Consultation, use of Te Reo, and upholding of Māori cultural concepts forms the foundation for cooperative relationships between researchers and Māori groups. In particular, cultural concepts of health and well-being must be affirmed and protected by the research process, encompassing Te Ao Māori, whakapapa (genealogy), tikanga (custom), te taha wairua (spiritual elements), taha whanau (family and community), taha tinana (physical elements), and taha hinengaro (emotional, psychological elements) (HRC of New Zealand, 2010). In the wake of colonial encroachment and dispossession, recognizing the impacts of historical and present-day sociopolitical context, and acknowledging importance of place and relationships are central to achieving hauora (optimal health, as defined by Māori) (Reinfeld & Pihama, 2007).

The significance of relatedness among researchers, participants, and their respective roles in communities was a theme repeatedly represented in the research of Te Karu and

colleagues (2013). Using an inductive qualitative approach guided by principles of Kaupapa Māori methodology, Te Karu et al. (2013) interviewed 12 Māori with gout using semistructured interviews to ascertain understanding, perception, and treatment of gout. Use of Kaupapa methodology added richness to the data gathered, consulting with health providers, local iwi, and local Māori leaders to gain unanimous support for the project. Recognition of matauranga Māori (Māori knowledge) and Te Ao Māori was upheld with use of open-ended questions in interviews, with most korero (discussion) conducted in participant's homes. Findings revealing overwhelming sufferance, feelings of self-blame and presumed blame of others brought to light the importance of connections with people for wellness (Te Karu et al., 2013).

Working at the Interface

Scientific methodologies and Indigenous methodologies are no longer distinct. Protocols can be and are being adjusted for research work that synchronizes Eurocentric scientific protocol with Indigenous scientific knowledge. Durie (2004) suggested working at the interface, identifying meeting grounds common to both paradigms and working toward the same goal of health. As protocols are amended and new methods are developed in approaches upholding of Indigenous beliefs, enthusiasm for participation can increase (Durie, 2004; Jones et al., 2013). More than any explanation, the *experience* of researching divergent worldviews or knowledge systems is engaging the interest of Western science-trained researchers and enabling, for example, researcher participation and reporting in customary ceremonies or rituals. As well as enriching researcher understanding, participation is changing researcher attitudes too (Durie, 2004; Jones et al., 2013; Shukla & Gardner, 2006).

Research Methods

Tilburt and Kaptchuk (2008) noted that "All research should hold the potential to achieve social value. Different entities may view the social value of traditional medicine research differently" (p. 579). Although research interests in knowledge production differ from practical interests of communities, emerging research now demonstrates mutuality in the contribution to and benefit from the research (Wallerstein & Duran, 2006). Local Indigenous and traditional knowledge is being revealed, sustained, and in some instances grown in the application of participatory research methods. Community members are empowered, enabled, and better resourced as an outcome of research that is providing opportunities to give voice and share personal stories (Jones et al., 2013; Shukla & Gardner, 2006; Te Karu et al., 2013).

Community-Based Participatory Research (CBPR)

A collaborative research orientation focuses on relationships between academic researchers and community members, with mutual learning opportunities for mutual benefit. A long-term commitment enables incorporation of community knowledge, encourages participation, and integrates community practices within the research process. CBPR has emerged as an integrated set of research methods using social action and education for improved health and reduction of health disparities. As CBPR has matured over recent decades, tensions have been raised surrounding the challenge of mutuality in research relationships. Some of the issues inherent to the dynamic and evolving context of research founded upon researcher–community relationships include power, privilege, discrimination, consent, participation, and the ability to affect social change (Wallerstein & Duran, 2006). Yet efficacy of methods central to CBPR is affirmed by multiple studies considered in this review (Jones et al., 2013; Kumar et al., 2006; Shukla & Gardner, 2006; Te Karu et al., 2013).

Community and Place

Numerous research articles in this narrative synthesis demonstrated usefulness of community-based research approaches in combining local healing knowledge with formalized systems of medicine. In a community-based research project, Shukla and Gardner (2006) demonstrated the importance of a community setting for exploration of connections with place and people for healing. Local knowledge was grown with community education sessions and resources were shared to foster backyard revitalization of endangered plants native to the area. Te Karu et al. (2013) found differences in care seeking behavior and treatments between rural and urban communities, reiterating the importance of place as the location for healing and, therefore, the importance of place in health research (Shukla & Gardner, 2006; Te Karu et al., 2013). Working in a community hospital, Kumar et al. (2006) found friends and neighbors were the most common source of CAM knowledge for the treatment of diabetes. In Te Karu et al.'s (2013) study, one participant explicitly recommended local marae-based services for improved access to and more timely provision of culturally appropriate care. Notably, Rongoa was found to play a significant role in the lives of those living rurally, where seven of eight rural participants used Rongoa as part of their daily routine to treat gout, physically and spiritually.

Power

As with Kaupapa Māori approaches, the central aim of health in CBPR is attained by way of committing to reciprocal researcher–community relationships (Jones et al., 2013). Power relations exist between the researcher and participants (Clough & Nutbrown, 2002). There is authority and power vested in those who are in possession of the methodology, with its underlying worldview (Royal, 2005). Important questions must be asked when researching the voice of others. Who is listening to the participants? Why are they listening to the participants? In whose interests are they listening? How

well is the participant able to articulate intentions and effectively tell his or her own story (Clough & Nutbrown, 2002)? The potential for full disclosure, meaningful discourse, and sharing of life stories can be limited between people with different worldviews, outlook, interests, and power, as it can be difficult for one another to step outside of their entrenched perspectives (Clough & Nutbrown, 2002; Durie, 2004). In particular, it can be difficult to elicit voices from those who have been marginalized or disempowered as "other."

Participatory Partnerships

Collaborative partnership is a primary requirement in international research ethics. Partners in research collaborations must share vocabulary to ensure social value and scientific validity (Tilburt & Kaptchuk, 2008). For Māori community health providers involved with Te Karu et al.'s (2013) research team, developing a meaningful, long-term partnership with a research institute resulted in opportunities to give voice to community health issues previously unheard. Incorporating the voices of the researcher as well as participants can be positional, political, and persuasive (Clough & Nutbrown, 2002). Community-based research by Shukla and Gardner (2006) in India, gave voice to community members, articulating with high persuasion the potential of their local knowledge, the place of vaidus (local healers) in health care, and the resources available naturally in their environment. Articulation of community voice was all the more persuasive with botany experts and outside researchers validating and recognizing the significance of local knowledge. Enabling articulation of a group that has been historically marginalized is now affecting change in government and biomedical structures of domination, as seen in environmental resource management and documentation of vaidu knowledge.

Storytelling

People appreciate an opportunity to share their story, to be listened to and understood (Jones et al., 2013; Shukla & Gardner, 2006; Te Karu et al., 2013).

As Seidman (1991) noted,

> Telling stories is essentially a meaning-making process. When people tell stories, they select details from their stream of consciousness . . . It is this process of selecting constitutive details of experience, reflecting on them, giving them order, and thereby making sense of them that makes telling stories a meaning-making experience. (p. 1, as cited in Clough & Nutbrown, 2002, p. 77)

Use of clinical rhetoric was identified as an issue in interviews conducted by Te Karu et al. (2013). There is a difference between rhetoric, utilized in clinical settings and policy processes alike, and reality as experienced by an individual (Pihama, Cram, & Walker, 2002). Rhetoric can reflect limitations in cultural competence and restricted understanding. In Te Karu et al.'s (2013) case, it also suggests the skill of the researcher *listening* more than merely hearing what is familiar. Where an uninformed researcher may have unconsciously missed this opportunity for insight, Te Karu and colleagues (2013), as Māori researchers sharing a relationship with participants and understanding of their circumstances, were able to steer and contribute to dialogue to give real voice to participants (Clough & Nutbrown, 2002). Participant recommendations for marae-based services came from their wanting to facilitate dialogue for better understanding of the doctors and pharmacists. Regardless of whether information was provided by health professionals, participants did not feel it was understandable nor did participants feel understood. Among Te Karu and colleagues' (2013) interviewees, none had knowledge of alternate treatment options even though most were unsatisfied with pharmaceutical treatment that formed the basis of their symptomatic relief of gout.

Relationships

Relationships formed by bringing people together in a research process can be healing in themselves. Participants in Jones and colleagues' (2013) Kaupapa Māori research felt understood by Jones's ability to identify with Māori perspectives, having shared experiences of asthma, and as a mother. Face-to-face interaction was pivotal to the cultural framework for extended fieldwork, which required researchers to know the community and be known by the community. Jones et al. (2013) also observed the way in which collective experiences fitted together (Clough & Nutbrown, 2002), using photovoice and drawings as an additional medium of articulation for parents and children. For researchers involved in transcribing and thematic analysis, the additional mediums were also helpful for coding as participants' articulation was not always as clear in narrative text as it was implicit in the understanding between interviewer and participant.

Gathering the Data

Kumar et al. (2006) selected 493 study participants by systematic sampling of 6,094 diabetes patients accessing a hospital outpatient endocrine clinic in Allahabad, India. Investigating knowledge and practice of CAM, including Ayurveda, homoeopathy, naturopathy, acupressure, and others, their study found that 71% of hospital attendees were aware of CAM treatment options. Furthermore, 95% of those with awareness of CAM treatments were using CAM as a diabetes treatment. Quick, additional relief lowering blood sugar, low cost, and availability were main reasons for using CAM, with data suggesting effectiveness and user satisfaction among 45% of CAM users were driving CAM use. Discussion of statistical analysis went so far as to suggest higher use of CAM could reflect dissatisfaction with allopathic treatment options, though it also concluded few participants were satisfied with CAM use exclusively. Generalizability of Kumar

and colleagues' (2006) sample is compromised as the study took place within a biomedical hospital setting, hence sample selection risks interaction with traits inherent to that population (Krageloh, 2008). In this instance, a survey among patients utilizing a specialized endocrine clinic for medical treatment of diabetes may not represent practices prevalent in wider populations. Community-based studies are needed to reveal actual usage patterns (Kumar et al., 2006).

Purposeful sampling was used in Slocum-Gori, Howard, Balneaves, and Kazanjian's (2013) research, inviting health care providers to participate in focus groups regarding implementation of a yoga therapy program. The group participating is therefore neither guaranteed to be a representative sample, nor are their comments necessarily generalizable. However, they do provide a collective viewpoint. Validity and generalizability are limited with groups assembled specifically for the purposes of research. Issues can be exacerbated when data are then analyzed and interpreted by researchers removed from the interview process (Clough & Nutbrown, 2002), as identified in the separate coding process undertaken by researchers removed from interviews in Jones et. al.'s (2013) research. Slocum-Gori and colleagues (2013) aimed to minimize such issues in an analysis process that combined focus group observation, an initial coding scheme, and refinement of thematic categories. Looking to education methodology, the authors found room for further methodological development. Focused conversations (as opposed to focus groups) can create a dynamic that is more allowing of contribution, reflection, reshaping, and rephrasing in the group process of conversing. In focused conversations, when the participating group are not only the data source but also analysts and coauthors of the research, issues of misinterpretation during data analysis are minimized (Clough & Nutbrown, 2002).

Interpreting the Data

Interpretive approaches have limitations. It may be that participants are required to make sense of their own experiences for the first time, at the time they are explaining them to the interviewer. Interviewers and researchers coding transcripts then have to interpret each participant and make sense of the participants' description of their experience. Jones et al. (2013) used interpretive phenomenological analysis as an inductive qualitative research technique for narrative analysis. Their analysis was grounded in the participants own articulation and sense-making. In the case of Jones's research, the researchers coding interview dialogue were not the interviewers. Removed from the cultural and social context of the community, those researchers coding data (by the author's own admittance) struggled to interpret full meaning of the data from transcripts alone. Although Jones et al. (2013) attempted to maintain validity by showing interviewees transcripts for feedback, layers of interpretive processes can affect accuracy of reporting.

Interpretation of research data is not limited to qualitative research. Kligler and colleagues' (2011) randomized experimental study of integrative care for asthma involved statistical analysis of QoL surveys and clinical pulmonary function data. In addition to yoga and yogic breathing exercises, the treatment plan also offered nutrition advice, supplements and food elimination, and encouraged personal journaling. Group yoga sessions made treatments more cost-effective and provided social interaction with others experiencing similar lifestyle changes. In such a complex, whole systems intervention, the issue of most importance in this study remains faithful interpretation of 154 complex individual experiences according to survey data. In the absence of face-to-face interviews, how does a survey designed by the researchers allow those researchers to see beyond what is already known? Are reported outcomes characteristic of the integrity and honesty that comes from a research practice of listening for what is not known (Clough & Nutbrown, 2002)?

Kumar and colleagues (2006) reported statistical data from interviews with 493 participants. Their analysis proved useful in making correlations between CAM use and objective determinants such as educational level, socioeconomic status, or age. However, their quantification and statistical analysis of more subjective areas, including knowledge of CAM and reasons for CAM usage, risked misrepresentation and may have oversimplified the data (Chacko, 2003; Krageloh, 2008). In contrast, Chacko (2003) used ethnographic methods to determine usage of complementary strategies in diabetes treatment. Her research also took place in India and found participants relied primarily on biomedical treatment for their condition, but often used Ayurvedic and folk remedies as supplements. In addition to employment of markedly different research methodology, her conclusions provided substantially different reasons for CAM usage. As opposed to finding correlations with age, education, and socioeconomic factors, Chacko's observations and use of open-ended questions during in-depth interviews revealed health management decisions were linked to cultural background and environmental resources. Where Kumar et al.'s (2006) research recommended biomedically based education in treatment options, including CAM, Chacko's (2003) research found evidence of locally based healing knowledge as a source of cultural capital.

Validity of the Data

Consideration of divergent methodology, diverse methods, and contradictory results brings one to question validity of the data. Where internal validity is the reliability of an intervention to produce an outcome in a controlled environment, external validity considers applicability of research outside of the testing conditions. The need for rigorous internal validity must also be balanced with external validity for real-life applicability (Krageloh, 2008). For researchers Ritenbaugh and colleagues (2008), the tension between internal validity

and external validity was evident in their application of a randomized controlled clinical trial protocol for assessment of a whole systems approach to treatment of temporomandibular disorders. One hundred sixty participants were randomized to three treatment arms to receive individually tailored care according to naturopathic, TCM, or speciality care. Efficacy was assessed according to four measures of pain, using a conditional change model to assess change. Protocols were applied to increase similarities among different practitioners administering care. Although variation in timing of endpoint data collection, involvement of multiple practitioners, and variability of individualized whole systems methodology may not satisfy calls for rigorous experimental controls, the research does sufficiently reflect the way in which these modalities are actually implemented in real-world practice (Tilburt & Kaptchuk, 2008).

Findings substantiating low reliability, questionable or subjective validity, and a lack of inter-rater reliability in studies involving multiple practitioners give rise to discussions pertaining to diagnostic uncertainty and variability. Diagnostics are an important feature in all health systems for two reasons: In the clinic, they are fundamental for their impact in treatment planning, efficacy, and outcomes (Joshi, 2004; Mist, Ritenbaugh, & Aickin, 2009), and in research, they are demonstrative of sound empirical basis and fundamental for their representation of theoretical underpinnings of the whole system being investigated (Mist et al., 2009). Mist et al. (2009) and Joshi (2004) quantifiably evaluated typical diagnostics used in TCM (tongue, pulse, and observation) and Ayurveda (evaluating prakriti based on observation and interaction), respectively. Mist and colleagues (2009) assessed inter-rater reliability and reproducibility of diagnostics between practitioners using Fleiss kappa statistical analysis to consider the reliability and validity of diagnostic judgments between practitioners. Joshi (2004) took a different approach, attempting to quantify what are traditionally subjective, observation-based diagnostic methods to evaluate accuracy of prakriti classification. Both studies found a sound empirical basis and consistency in diagnostics, indicating transferability of research and potential applicability of quantified measures in future studies (Joshi, 2004; Mist et al., 2009).

The importance of clinical validity for the production of "valid" knowledge reflects biomedicine's prevailing attitude of superiority, stemming from empirical establishment. The profession holds that it has the scientific basis, university education, professionalization, and laboratory validation to prove efficacy, which alternatives do not. Yet, although that may be the dominant ideology, reviews of the evidence suggest a relatively small proportion of clinical procedures are in fact scientifically established with the gold standard double-blind randomized clinical trial (Winkelman, 2009). As identified by Kligler et al.'s (2011) and Ritenbaugh et al.'s (2008) research teams, for the obvious reasons of ethical dilemma and practicality, ideal investigation standards are not always possible. Consequently, allopathic medicine is also guided by clinical observation, the same system of verification used for centuries in Indigenous and alternative healing traditions (Winkelman, 2009).

Convergence of the Data

Diametrically opposing conceptual approaches and diagnostic criteria can make comparison between research in biomedicine and alternative medicine systems problematic, though not irresolvable (Saini, 2012; Winkelman, 2009). Finding a degree of parity with allopathic standards, according to Eurocentric research standards, appears to be a widespread goal among the research synthesized (Joshi, 2004; Kumar et al., 2006; Mist et al., 2009; Ritenbaugh et al., 2008).

In investigating the possibility of quantifying Ayurvedic diagnostics, Joshi (2004) provided a foundation for clinical comparison between Ayurvedic diagnostics and allopathic clinical standards of measurement. Based on pioneering psychology research analysis of personality types (Eysenck & Martine, 1987, as cited in Joshi, 2004), Joshi suggested his method for translation of typically subjective data to quantitative estimates may help with the scientific establishment of Ayurveda. Making recommendations for further application of the methodology, such as computation of nadi patterns for diagnostic assessments, Joshi (2004) stated quantitative estimates are a necessary basis for biostatistical analysis of Ayurvedic diagnostics that may prove advantageous in the convergence of Ayurvedic research data with Western approaches for integrative health approaches.

In addition to being a useful tool for increasing validity, triangulation is one method of cross-validation for assessing congruency across methods and practices (Saini, 2012). Multiple applications of triangulation were central to the research process undertaken by Jones et al. (2013) whose research provided a sound example of strategies to ensure data reliability and validity. For data triangulation, interviews sought to elicit further perspective from other whanau (family) members. Method triangulation was achieved using photovoice, drawings, and observational field notes to enrich interview content. Investigator triangulation was achieved by consultation with members of the research team, seeking collective agreement regarding themes. Theoretical validity was achieved with peer review by outside research experts, and extended fieldwork engaging community members in consultation.

Research Measures

In addition to the matter of *how* to measure health and healing, it is worth considering *what* to measure. Measures of health care efficacy and effectiveness are variable. They are also changing. The dominant research interest of science is shifting from the absence of symptoms to the distinct goal of

wellness. This shift in focus has been a catalyst in the development of new research measures (Durie, 2004) more aligned with native science's prioritization of gathering understanding and meaning from data rather than seeking to control or predict research outcomes (Cajete, 2004). Increasingly, mixed methods of research are adding meaning to quantitative data (Slocum-Gori et al., 2013), as the value of subjective experiences of health as a source of both meaning and knowledge is more widely recognized (Cajete, 2004).

Outcome Measures

The measure of outcomes, as opposed to outputs, is also being recognized as a more appropriate and meaningful way of assessing effectiveness in health care. Outcome measures are not comparable with clinical rating scales or patient satisfaction surveys because they are not confined to particular health measures. Outcome measures allow for a more global perspective and may incorporate individual, whanau, and clinical views of physical, emotional, social, environmental, and spiritual domains (Durie, 2004). Valid outcome measures for TCAM research must be consistent with terminology and concepts unique to each healing system. To measure effects of therapies on QoL, researchers such as Joshi (2004) are working to create analogous measures appropriate to healing traditions. As new outcome measures overlap with existing measures, increasing contribution can be made to existing knowledge bodies (Tilburt & Kaptchuk, 2008).

Wellness Measures

The premise of Indigenous health research measures is that wellness should be a key objective for the intervention. With a shift in measurement, from outputs to wellness, comes an increasing need to understand the way in which health is conceptualized. If the measures are to be both accurate and useful, they must be constructed according to Indigenous concepts of health (Durie, 2004). Thus, fundamental to research in Indigenous health are Indigenous understandings of health itself (Durie, 2004).

Understandings of wellness differ between and within worldviews. Connor (2012) explores two definitions of well-being: extrinsic and intrinsic. He explains extrinsic well-being as a deriving of wellness from material means represented as standard of living and QoL. Government reporting of economic growth or poverty alleviation as a determining factor for health is an example of Western-centric aspiration of well-being as earning potential. Kumar and colleagues (2006) research aligns with extrinsic well-being values, looking for correlations between CAM utilization and variables including socioeconomic and education status as health indicators. In contrast, research by Shukla and Gardner (2006), Jones (2013), and Chacko (2003) investigated intrinsic well-being. Intrinsic well-being comes from feelings of fulfillment and enhanced relationships that promote well-being of places, sustaining the community and environment. Indigenous-inspired wellness frameworks are centered on aspects of intrinsic well-being including identity, autonomy, control, community inclusion, and family kinship. Well-being is therefore a direct result of relationships with people and care for ecology in the places we share everyday (Connor, 2012).

If comparisons are to be made between health systems grounded in divergent worldviews, with contrasting definitions of well-being, researchers must possess expertise in the system being studied as well as the research methodology applied to be informed in their exploration during the research process and in creative application of the research data. The innovation must not risk diminishing innovations of the past. Rather it must uphold the wisdom of the past to inspire new responses to wellness challenges, in a world that has vastly changed over the centuries (Royal, 2005). Both Joshi (2004) and Mist et al. (2009) identified the importance of researcher background expertise in the system being studied. Understanding theoretical underpinnings of the whole system that is being evaluated allows for recognition of subtleties that may otherwise be overlooked or misinterpreted. Thus, it is evident that the focus is shifting from analysis of small components of healing practices to the wider context of parent knowledge systems, upholding diverse values and more fully recognizing interacting components of the healing process (Winkelman, 2009).

Transfer of Knowledge

Contrary to those critics who suggest rejuvenation of ancient knowledge would be "going backwards," in this time of increasing globalization and increasing prevalence of chronic lifestyle health conditions (Chacko, 2003; Durie, 2004; Kumar et al., 2006; Murthy, 2010), there may be much understanding to be gained from traditions that have observed the health impacts of urbanization over thousands of years (Murthy, 2010; Royal, 2005).

Knowledge of ancient health traditions is often transmitted orally through generations, emphasizing practice-based teaching and practical learning. Information may be codified within scriptures or undocumented (Shukla & Gardner, 2006). Shukla and Gardner (2006) made a useful distinction between local medicine traditions, describing traditional systems of medicine (TSM) as those based on systematic codified knowledge from pharmacopedias or ancient scriptures in comparison with traditional medical knowledge (TMK) or folk medicine, which is orally transmitted with skills acquired by "doing." Even in the absence of formalized texts and distinct lack of legal or political support, these systems have endured over time.

Community Knowledge

CBPR approaches are revealing the immense potential of local knowledge in growing and legitimizing TCAM knowledge, applicability to wider audiences, and recognition by

governments and nongovernment organizations (Shukla & Gardner, 2006). Research of Shukla and Gardner (2006) has provided a platform for which formally trained scientists and botanists can interact with holders of traditional knowledge. In addition to their achievements implementing community-based conservation, outcomes of their work demonstrate the huge potential for legitimization of knowledge, community education models for knowledge transmission, collaborative funding and research opportunities, and mobilization of communities. Their effective implementation of a grassroots research approach is also informing government agendas for ecological sustainability and health. The challenge is one of durability, requiring supportive legislative and policy measures beyond the community, at national and international levels (Shukla & Gardner, 2006).

Systematic Reviews

The systematic review is a research approach to knowledge transfer that aims to bring primary research evidence closer to decision making. Regarded as the most reliable method of summarizing data and evaluating evidence, systematic reviews of CAM can affect considerably health care decision making, media portrayal, public opinion, and attitudes among the scientific community (Linde, 2009).

In a systematic review of mixed method studies considering the credibility of aboriginal research designs, Saini (2012) found none of the 68 reviewed studies conducted a cross-validation analysis between aboriginal and Western research methodologies. In this absence of evidence, Saini (2012) found grounds neither for the dismissal of Indigenous research designs nor for necessitating use of Western measures of validity and reliability. Rather, Saini (2012) found justification to move away from conformity to Western scientific processes toward culturally relevant standards of participation, authenticity, and tradition in research processes. Without examining feasibility and limitations of applying Western notions of validation to assess credibility of Indigenous knowledge, scientific "rules" of research can be used as a control mechanism rather than a method of knowledge expansion. Such ethnocentric epistemology can lead to the assimilation of traditional knowledge into Western frameworks, under the guise of facilitating "legitimate" discourse (Saini, 2012).

The highly subjective and interpretive nature of methodologies currently being explored for the investigation of whole systems of Indigenous healing has some bearing on the reliability and validity of systematic reviews in CAM, including Indigenous healing systems. Insufficient reporting, publication or funding bias, and errors in quality assessment are issues creating controversy and debate in both CAM and biomedicine. Systematic review methods are well developed for RCTs; however, methods for the systematic review of qualitative data are still developing (Linde, 2009; Ring, Ritchie, Mandava, & Jepson, 2010; Tong, Palmer, Craig, & Strippoli, 2014). Thomas and Harden (2008) described "thematic synthesis" as one approach to analyzing and synthesizing qualitative research in systematic reviews addressing questions about the lived experiences and perspectives of people. Using health promotion and public health as the context for their methodological development, their work is moving beyond the assessment of "what works?" to answer policy makers' questions about intervention need, acceptability, appropriateness, and intervention implementation.

Despite these limitations, in a comprehensive analysis of more than 8,000 Ayurvedic research articles, sourced from approximately 700 research journals, Manohar, Eranezhath, Mahapatra, and Manohar (2012) found close to half of the published research literature on Ayurveda is in the form of a review paper. What is more, their findings suggest a majority of original research is specific to subjects of drug standardization and preclinical studies. Although clinical trials, case studies, and case reports were sourced and included in the review, a scarcity of research assessing Ayurveda as a whole system (Manohar et al., 2012) indicates the substantial research gap and the need for development of methodologies. Once a body of literature is established utilizing new methodologies appropriate for whole systems research, systematic reviews may yield more accurate results.

Applicability of TCAM Knowledge

Perspectives holding TCAM as subsidiary to biomedicine are reiterated and reinforced with research funding allocation. Those few studies funded by biomedical organizations investigating TCAM as an alternative to biomedicine are unlikely to offer true assessment of their potential (Winkelman, 2009). In a randomized controlled clinical trial of acupuncture treatment for hypertension published by the American Heart Association, Macklin et al. (2006) found "active acupuncture provided no greater benefit than invasive sham acupuncture in reducing systolic or diastolic blood pressure" (p. 838). Yet, despite the rigorous methodology cited in the article, physiological changes and reported outcomes are curiously contrasting. For example, decreases in diastolic blood pressure are consistently greater among those receiving individualized acupuncture than those receiving sham acupuncture throughout treatment duration and for more than 35 weeks following treatment commencement. It is beyond the scope of this article to investigate or presume motivation of any author, publication, or funder. However, reporting limitations of some papers prompts questions surrounding potential bias.

Repositioning of Indigenous and traditional healing systems as complementary rather than alternative systems of medicine may reduce polarity with biomedical systems and, in turn, allow traditional medicines a greater role in mainstream health systems as a tool for healing and health promotion (Murthy, 2010). Integrative medicine takes this a step further. Investigating the feasibility of yoga therapy integration, Slocum-Gori and colleagues (2013) based their research

at an urban cancer center. Using a mixed methods approach including focus groups with health care providers and breast cancer survivors as well as self-reported surveys, the research aimed to understand factors that might impede or promote integration of yoga therapy. Data gathered from breast cancer survivors indicating previous use of CAM and yoga practice suggested acceptability and sustainability of a yoga therapy program. Corroboration obtained from health care providers regarding feasibility and existing literature documenting outcomes of yoga therapy provided evidence of practicability and potential effectiveness of an integrative treatment program. The oncology setting was a significant choice of site in that it was later to become the site of integrative cancer treatment services, beginning with yoga therapy.

Slocum-Gori et al.'s (2013) research team also addressed social factors with provision of group yoga therapy. TCAM, especially Indigenous traditions, consider social environment and health of the collective peoples central to care, whereas biomedicine's primary concern with biological well-being means a biomedical physician may focus treatment purely on the individual. Slocum-Gori and colleagues' (2013) study is significant for their examination of compatibility of biomedical care with yogic healing practices affecting the subtler energetic body, breath, and mind. Such concepts expand biomedical preconceptions of the body. In TCAM healing traditions, the physical body is just one of multiple levels of the body upon which healing can operate.

Vitalism underlies the basic principle of self-healing that is central to many TCAM therapies and Indigenous realities. Vitalism emphasizes the body's innate ability to restore natural balance, allowing linking between the sacred and secular, spiritual and scientific. Indigenous beliefs remind us that such aspects are not distinct. On the contrary, they are constantly interacting within and without the client to produce health (Winkelman, 2009). Quantum science may be bringing Indigenous understanding of nature closer to Western scientific thought, with chaos theory explaining the process of movement and evolution of energy for creation of new forms (Cajete, 2004). Such theories are relevant to growing research knowledge too, as inherent to Indigenous knowledge is the notion that the world is an embodiment of knowledge. Thus knowledge is energy, intrinsic to the world, inseparable from lived experience and more than merely a finite product of research (Royal, 2005).

Receptivity to the Learnings

There has been a struggle for the space for Indigenous initiatives, in health and education alike, raising the issue of receptivity to Indigenous ways within mainstream institutions established according to Eurocentric values and hierarchy (Pihama et al., 2002). For Kaupapa Māori researchers and writers, including Tuhiwai-Smith (1999) and Bishop and Glynn (1999, as cited in Pihama et al., 2002), Indigenous research methodologies are a counterhegemonic movement indicative of a proactive political discourse. Research validating Indigenous reality challenges unequal distribution of power and structural barriers. Indigenous people are no longer positioned as "other," but become the norm in their own cultural construction.

Historically, contests between peoples were territorial. Increasingly today, contests are cultural and intellectual, seeking to determine areas in which Indigenous knowledge can prevail or coexist for the benefit of Indigenous people and, indeed, all people (Durie, 2004). Political and social dominance of biomedicine can lead to technical, organizational, and administrative absorption of TCAM systems of medicine, with the adoption of techniques, control of practices, and assimilation of knowledge. As traditional remedies are recognized as effective, pharmaceutical firms and multinational corporations have made attempts to seize rights and patent active plant compounds for commercial use. Although international law protects customary knowledge of Indigenous communities, cultural mediators are required to define who constitutes the Indigenous community, acquire informed consent, establish cooperative agreements, and broker the gap between local and global systems (Winkelman, 2009).

Contributions to the translation of health knowledge from diverse worldviews are accruing across disciplines (Chacko, 2003) free from constraints of biomedical partiality (Winkelman, 2009). This narrative synthesis finds health geography is identifying relationships between health and place (Gesler & Kearns, 2002), anthropology and sociology are lending research methodologies and providing insights linking health and culture (Winkelman, 2009), and education is identifying differences in wellness aspirations and methods for empowerment in the research process (Clough & Nutbrown, 2002; Connor, 2012). The weaving of knowledge, experience, and expertise across typical discipline and sector boundaries is not to undermine the positioning of boundaries encompassing areas of expertise. Rather, to position knowledge within a broader multidimensional whole and maximize potential for unexpected, innovative discoveries (Royal, 2005).

Conclusion

The expansive nature of TCAM and Indigenous knowledge derived from intellectual and spiritual praxis is challenging researchers to develop methodologies capable of examining spirituality, belief, and experience while maintaining objectivity (Ahuriri-Driscoll, 2014). At a time when the value of such knowledge is being increasingly recognized for its potential to contribute to well-being of not only populations but also the earth on which we live, the need for such methodologies is urgent (Ahuriri-Driscoll, 2014; Murthy, 2010). Currently, researchers are balancing representation of Indigenous worldviews, TCAM participants' realities, and the need to conform to conventional research protocols (Ahuriri-Driscoll, 2014; Ritenbaugh et al., 2008). Maintaining

research credibility is not just about integrity in research processes and proper selection of methodology. It is also about the taonga, the gift, of participants' stories (Jones et al., 2013).

Clough and Nutbrown (2002) suggested the rationale for methodology selection may be as much an act of faith and feeling as a cognitive process. Whole systems research (Langevin et al., 2011; Ritenbaugh et al., 2008) allows consideration of context in which the healing system originates, the place in which research is being conducted, and the sociological dynamics, including structural factors, that are reproducing or redefining health outcomes (Abraido-Lanza, Armbrister, Florez, & Aguire, 2002). Kaupapa Māori research included in this synthesis also demonstrates methods are becoming intrinsic to the issue for investigation, rather than extrinsic and separate from it (Jones et al., 2013; Te Karu et al., 2013). In this sense, the methods researchers choose can be tested as much as their hypotheses or objectives (Clough & Nutbrown, 2002). Although not made explicit, in some studies (e.g; Macklin et al., 2006) the assumption is that effective measures of efficacy will bring healing practices in line with a set of values and measures, standardized according to biomedicine. Rather, such research risks limiting understanding of complex healing responses and outcomes.

Tierney (1998, as cited in Clough & Nutbrown, 2002) concluded that new methodological and epistemological avenues demand the charting of new paths, not the repeated return to well-worn paths. Yet, in the literature reviewed, many researchers are walking well-worn research paths with investigations conforming to methodologies based on scientific philosophy. The methodological gap in truly innovative research methodologies is now fusing with the potential of Indigenous science–based research approaches. Even in light of distinct identities, these methodologies have common philosophical foundations reflective of cultural and community epistemology (beliefs and knowing), ontology (nature of being), and axiology (values and behaviors). This reconciliation of academic research priorities with TCAM knowledge and Indigenous realities (Royal, 2005) is expanding research methodologies, growing a body of literature, and supporting TCAM incorporation in community and hospital health for innovative practice and health care provision (Coulter et al., 2014).

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Author Contributions

A.M. designed the search strategy, searched the literature, assessed study eligibility, critically appraised the studies, managed the citations, and wrote the narrative. R.K. was involved in the design of the work, consulted on study eligibility to reach consensus and reviewed and edited the draft manuscript. Both authors read and approved the final manuscript.

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