

Cultural invisibility: Māori people with traumatic brain injury and their experiences of neuropsychological assessments

Margaret Dudley, Denise Wilson *Auckland University of Technology, Auckland, New Zealand*

Suzanne Barker-Collo *University of Auckland, Auckland, New Zealand*

Objectives: To explore aspects of Māori culture and cultural appropriateness of the neuropsychological assessment process. **Participants:** 16 Māori who had undergone a neuropsychological assessment following a traumatic brain injury. **Research design:** A qualitative study using semi-structured interviews that were thematically analysed. **Results:** The four themes were: positive experiences, cultural invisibility, having little or no choice, and preferred ways of doing things. **Conclusions:** Neuropsychological assessments are driven by the dominant Euro-Western culture, which renders the cultural identity and practices of Māori invisible. **Implications:** Cultural factors are known to impact neuropsychological functioning, which may have significant clinical implications for culturally and linguistically diverse clinical populations. More culturally friendly processes for neuropsychological assessments would promote motivation to achieve better performance.

Keywords: Māori, Indigenous health services, neuropsychology, assessment, culture, traumatic brain injury

In this paper, we will report findings from a qualitative study with Māori about their experiences of neuropsychological testing. Māori have high morbidity and mortality rates associated with neurological trauma, and are highly likely to present for neuropsychological testing for rehabilitation purposes. However, neuropsychological functioning is not determined by brain functioning alone and can be affected by a number of other factors such as effort (Tombaugh, 1996), fatigue (van der Linden, Frese, & Meijman, 2003), pain (Grigsby, Rosenberg, & Busenbark, 1995), and cultural experience (Ardila, 1995; Uzzell, 2007). Various theories have been postulated to account for between cultural group differences and include diverse explanations such as genetic variation, the utilisation of tests that measure different cognitive constructs in different cultures, and the clinicians' understanding of and experience with

different ethnic groups which has been found to systematically impact that group's test performance (Brickman, Cabo, & Manly, 2006). Neuroimaging has provided us with knowledge about the brain's exceptional plasticity and flexibility. There is now research that suggests that this pliability in the development and organisation of the human nervous system may be directly influenced by cultural experience and its correlations with education and acculturation (Ansari, 2012; Baltes & Singer, 2001; Gergen, 2010).

Māori have been colonised, and similar to other Indigenous peoples experience marked health inequities (King et al., 2008). They make up 15% of the population (Statistics New Zealand, 2013a) and have overall the poorest health status of all ethnic groups in New Zealand (Ministry of Health, 2010). The disparity in health status between Māori and non-Māori is an unacceptable phenomenon common

with other comparable Indigenous populations worldwide (Ring & Brown, 2003). One of the barriers to equitable health outcomes for Māori lies in the failure of health organisations to deliver culturally appropriate services that embrace Māori cultural practises and which are user-friendly and accessible to Māori. Equitable health-related access and outcomes for Māori in New Zealand when they seek health care services is a guaranteed right under Article 3 of the Treaty Waitangi (an agreement between the Queen of England and Māori and administered by the New Zealand Crown), which says that Māori have the same rights as others living in New Zealand (Durie, 1998). Acknowledgement of the Treaty of Waitangi is now firmly embedded in the NZ Psychological Society's Code of Ethics and its values underpin the New Zealand's Psychologist Board's guidelines for competent practice for psychologists (New Zealand Psychological Society, 2002).

Mortality and morbidity rates show neurological disorders feature prominently in the overall poor state of Māori health. In a recent incidence study, Māori had a significantly higher relative risk (RR 1.23) of mild traumatic brain injury (TBI) than other ethnic groups living in New Zealand, and are 3-4 times more likely to have assault as the cause of a TBI (Feigin et al., 2013). Furthermore, the stroke incidence for Māori is similarly disproportionate (RR 1.7-2.7; depending on type), and they also suffer stroke earlier than non-Māori (mean = 65 years vs 75 years) (Feigin

et al., 2006).

Individuals with neurological insult are often required to undergo a neuropsychological assessment to determine if cognitive impairment has occurred. However, there is now an international body of research indicating culture is a confounding factor on neuropsychological performance, and those individuals who are not of the dominant western culture may be disadvantaged (Agranovich, & Puente, 2007; Walker, Batchelor, & Shores, 2009). The few studies conducted in New Zealand also suggest that Māori may have performed sub-optimally due to the exclusion of culture in the assessment process (Ogden & McFarlane, 1997; Ogden, Cooper, & Dudley, 2003). In contrast, Māori participants expressed positive feelings and performed better when cultural content and cultural practises were included (Haitana, Pitman & Rucklidge, 2010; Shepherd & Leathem, 1999). The high prevalence of Māori with neurological insult, necessitates further research into the impact Māori culture has on neuropsychology and neuro-rehabilitation services.

Qualitative descriptive research design was chosen for this study with Māori so that we could talk to them and explore their experiences of the neuropsychological assessment process. The aims of the study were to (a) explore whether any aspects of Māori culture had been included in their neuropsychological assessment process, and (b) determine the culturally appropriateness of the neuropsychological assessment process.

METHODS

Ethical approval was obtained from the Auckland University of Technology’s Ethics Committee (12/127). Ensuring the cultural acceptability of the study was important particularly as the participants, principal researcher and mentor all identified as Māori. Therefore a Māori-centred research methodology informed the research process. Māori tikanga (correct procedures, customs, practices) and principles described by Smith (2012) guided the way the research process was undertaken, and involved:

- Ensuring respect for the people

at all times;

- Conducting all meetings face to face;
- Observing, listening and reflecting before speaking;
- Sharing, hosting, and being generous to all;
- Being politically astute, culturally safe, and reflective about researchers’ insider and outsider status;
- Informing people and guarding against being disrespectful, paternalistic or impatient; and
- Finding ways of sharing and being generous with knowledge, without being boastful or arrogant

Furthermore, to ensure Māori tikanga was observed and honoured at all stages of the research, Māori elders were frequently consulted for cultural guidance.

Participants and recruitment

The study sample comprised 16 participants who met the following inclusion criteria:

1. Self-identified as Māori;
2. Had undergone a neuropsychological assessment within the previous five years;
3. Had no memory deficit that would impact participation; and
4. Were able to communicate effectively.

Flyers outlining the study and participant information sheets were distributed to practising neuropsychologists, hauora (Māori wellbeing) clinics, and neuro-rehabilitation organisations within Auckland and the upper North Island of New Zealand. Potential participants were informed of the study by neuropsychologists, occupational therapists, and psychologists, and contacted the study using the details on the flyers and participant information sheets. If they met the inclusion criteria, a suitable time and venue was negotiated to conduct an interview. Neuropsychologists, occupational therapists, and psychologists screened potential participants for any memory deficit that would impact participation in the study. Potential participants not meeting the criteria or those who contacted us after recruitment ended

were respectfully declined and told why. All interviews took place in the participants’ homes.

Participant characteristics

All participants had undergone a neuropsychological assessment following a traumatic brain injury as part of their state funded medical care. Participants’ ages ranged from 16 to 64 years. There were more men (n=9) than women (n=7) in the sample, with more from urban (n=9) than rural locations (n=7) (see Table 1). Half of the sample had an annual household income of \$30,000 or less, with only one above \$50,000 – these are well below the median income of \$68,600 (Fallow, 2013). The majority of participants had sustained a severe head injury, however, their memory was sufficiently intact to recall detail of their neuropsychological assessment experience to inform this study. All participants spoke English as their first language and elected to be interviewed in English.

TABLE 1 Participant Demographics

Demographics		Number (n)
Age	Range	16 – 64 years
	Mean	37 years
Gender	Male	9
	Female	7
Household Income	\$10,000 - \$30,000	7
	\$30,000 - \$50,000	6
	\$50,000 +	1
Geographic Location	Urban	9
	Rural	7
Severity of Injury	Mild	1
	Moderate	4
	Severe	11

Most participants were able to identify their iwi (tribe) and hapū (sub-tribe), and affiliated with a variety of tribal groups. The participants were extensively involved in “Māori cultural activities” in their daily lives, attending their marae (local communal meeting house) for occasions such as tangihanga (funerals), kawē mate (memorial services), weddings,

birthdays, and similar events. Most participants had some ability to speak Māori, some had conversational skills, and one was a fluent Māori language speaker.

Data collection

Digitally recorded semi-structured face to face interviews, considered the most culturally appropriate method, lasting between 20 to 60 minutes were used to collect data (Braun & Clarke, 2013). Flick (2004) argued that participants are more likely to express their viewpoints through face to face interviews than using a survey questionnaire. The interview schedule enabled each participant to be asked the same questions, while answers could be explored in more detail if relevant. An interview schedule, that included prompt questions, was used to ensure we had covered all areas of interest the participants had not covered when they shared their experiences. Interviews predominately took place in the participants' homes, and participants were given the opportunity for a family member to support them, if they wished.

The Māori centred process meant that participants were asked if they wanted karakia (a Māori cultural blessing) to open and close each session. Furthermore, in recognition of the importance of kinship and relationships for Māori, each interview began with whakawhanaungatanga (a two-way process of making connections), a process for establishing relationships that involved sharing tribal affiliations, and whakapapa (geneology). Following this process of engagement, the participant information sheet (in both Māori and English) was explained and any questions participants had were answered as part of the written informed consent process. Confidentiality of the information shared was reconfirmed, along with the right to withdraw from the study at any time up until data analysis commenced. Consent forms were kept separate from data, and both stored securely. In keeping with Māori practices and the value of reciprocity, a koha (gift) was given to participants in the form of a small grocery voucher in recognition of their time and travel associated with contributing to the

study.

Data analysis

All interviews were transcribed by someone familiar with communicating in Māori, after signing a confidentiality agreement. Each transcript was checked for accuracy. Braun and Clarke's (2013) thematic analysis involved the transcripts being coded and collated to identify similar themes and patterns. This was a five phase process that involved: (1) *Becoming familiar* with the data during data collection and several repeated readings of the data; (2) *Generating initial codes* by reading the transcripts for data-driven and theory-driven codes, which were examined for consistency within, and distinctiveness between, categories; (3) *Searching for themes* between the coded data, accomplished by drawing mind maps and naming each code and sorting them into theme piles; (4) *Reviewing sub-themes* by revising and refining sub-themes and the emergence of overarching themes, and finally, (5) *Defining and refining* the data to ensure that each theme was clearly defined.

Research rigour

Lincoln and Guba's criteria of credibility, transferability, dependability and confirmability were used to establish the research rigour (Lincoln & Guba, 1985). Credibility of the data was established by spending time in the field, cultural supervision, and verification of the digital recordings of each interview with the relevant transcript. Moreover, the analysis was checked by others in the research team. Transferability relates to ensuring a range of Māori with traumatic brain injury were interviewed, and that the robust description of the themes reflected the comparative analysis across the transcripts. Furthermore, the findings have been presented to a range of neuropsychologists who have confirmed the applicability of the findings to their practice. Dependability involves a description of the research process, particularly the data collection and analysis phases. Confirmability was established through a process of reflexivity and ensuring research bias was avoided during data analysis.

RESULTS

Themes

Four themes describe the experiences of Māori having a neuropsychological assessment: *Positive experiences, cultural invisibility, having little or no choice, and preferred ways of doing things*. While participants identified positive aspects, it was clear from the participants' stories that the dominant Euro-Western cultural process drove neuropsychological assessments. *Cultural invisibility* demonstrates the importance of cultural practices, such as whakawhanaungatanga and karakia for spiritually clearing the way forward and making clients feel comfortable with the neuropsychological testing process. In addition, participants provided information on areas that would make this process more accessible and friendlier.

Positive Experiences – encompasses those aspects of the neuropsychological assessment that participants' were satisfied with, from the time they were first made aware of their upcoming assessment through to the point of contact between themselves and the neuropsychologist. In addition to possessing competent clinical skills, the ability of the neuropsychologist to use acceptable processes to establish rapport and connect with a Māori client was as signpost of a positive experience. Defining features of a positive experience included acceptable processes being used and the importance of establishing good rapport and engagement at the beginning of the assessment. One participant explained:

He [neuropsychologist] was really great, you know. . . he broke it all down for me. He was brilliant I've got to say, and he explained a lot of things and just took me back you when he was with the All Blacks [New Zealand rugby team].

Other participants stated:

The lady there was quite good. She asked me if I wanted a coffee or anything while I was there [for the neuropsychological assessment] . . . at that time it was winter so it was quite cold outside, but the lady had the fire on so it was quite good.

She was good at making me feel ok. And just getting me to rebalance and stuff. So that was really nice.

Despite participants reporting positive aspects of their neuropsychological assessment, the approaches informing the practice of neuropsychologists were not inclusive of cultural matters. This meant that participants' cultural selves were rendered invisible.

Cultural invisibility – refers to the neuropsychologist neither acknowledging nor inquiring about the participants' Māori identity and their cultural backgrounds. While this oversight was seen as normal for some when engaging with dominant health services, and therefore expected, some participants were offended and resented the neuropsychologists' indifference to their Indigeneity. *Nah, it's a Pākehā [dominant cultural group] place [neuropsychologist's office] – you don't expect it [cultural acknowledgement]. As a Māori, you always feel different going into anything that's Pākehā. I'm bloody 60 years old! Nothing in my life leads me to expect that. That's just a fact.*

The importance of being Māori was something that participants wanted acknowledged, especially as their daily lives and activities centred on being involved in Māori life. Furthermore, the non-acknowledgment of their cultural identity meant an absence of "normal" Māori processes of engagement, such as the process of relationship building by sharing who they were and where they were from. In fact, no questions were asked about their cultural affiliations or identity, even when some participants indicated involvement in their Māori community.

Māori had nothing to do with it. I just put my ethnicity on the form.

No, she didn't ask about whakapapa [genealogy] but in general conversation for her to get an overall feeling of who I am; I alluded to [cultural] things. Like when she said, "Are you involved in the community?" I said, "I'm involved in the Māori community, being a licensee to kohanga reo [Māori language preschools]"

I told him I was Tuhoe, but I could see it didn't mean anything to him.

These were missed opportunities for the clinician to have developed a rapport with the client. To have shown some interest in the fact that

the last client was Tuhoe would have assisted in establishing a trusting and respectful relationship. The lack of acknowledgement of this client's iwi created a barrier, and led to the client feeling reluctant to engage with the neuropsychologist and the assessment process.

In addition, participants noted the lack of Māori ways of doing things, such as having the opportunity to say a karakia before the assessment began, or whether they preferred to speak using Māori language.

I think if they really cared they would have asked what your nationality was and to see if you wanted anything done, like karakia. Being part Māori I have that spiritual thing in me. . . . So I know that doing that sort of thing with any kind of doctor, it helps.

Overlooking the role of cultural identity and the connection to cognitive functioning disregards the impact of cultural bias and culture on neuropsychological assessments. Moreover, participants reported not being given options or choice.

Having little or no choice – participants reported the lack of or limited choice they had in determining how the neuropsychological assessment processes and procedures were managed before, during and after an assessment. This resulted in a sense of disempowerment, aided by receiving very little information prior to an assessment that continued throughout the whole process. Most participants were unaware of the neuropsychological assessment purpose or process, although some had received information from other health workers. As one participant succinctly noted:

I never knew what to expect [for the neuropsychological assessment].

Another participant explained the importance of neuropsychologists providing information to the client:

Again it's like you're going to all these people who you have no idea who they are or what they are trying to achieve. To me it felt like another part of the getting well that I had to do, but not understanding why I was there. I suppose I should have asked but you feel a bit intimidated sometimes.

The importance of having a choice

of venue was explained by another participant:

I would have had it at home, just because the stage where I was at, at that time – it's familiar surroundings. I just think it wouldn't have added to my anxiety. I never ever experienced this [anxiety] until my head injury and those kinds of things are heightened really quickly for me, so to be given the option I would have been quite happy to have it at home.

The following participant reflected an element of cynicism about the process, also expressed by a number of other participants:

It just felt like you were put through the system and it feels like they are just taking money, and I don't see the value of going there. But I don't know what they charge, but I couldn't imagine it would be cheap. I couldn't see any value in it.

Preferred ways of doing things – refers to participants' thoughts about the practices and protocols that would make the neuropsychological assessment both meaningful and friendlier. Most participants indicated a preference for Māori-friendly assessments – it is about what matters to Māori clients and attending to their needs. Participants noted a cultural divide existing between Māori clients and neuropsychologists:

That is very much where the neuropsychologist comes, a medical model, a Western view . . . and the way it positioned us, like because [if] we didn't go down that path [recommended assessments and interventions] we were not caring.

Participants also believed rehabilitation was conducted within a medical model, contrary to the holistic Māori worldview. Therefore, participants thought only part of their healing process would be addressed by the neuropsychological rehabilitation recommendations and outcomes:

. . . like his tinana [physical dimension] and hinengaro [psychological dimension] can be healed here [rehabilitation] but when he gets home his wairua [spiritual dimension] will be healed and that is all part of his Māori stuff. They might not realise it around here, but he won't be 100 percent until he is home.

There was an overwhelming

indication that participants preferred to have been assessed by a Māori clinician. It was thought that better relationships could be formed with a Māori clinician, who would have had a deeper understanding of them and their realities.

I just felt you could relate with Māori a bit more. They have more understanding you know, from my perspective.

Participants' elevated anxieties arising from being assessed by a clinician from a different and/or a dominant culture can be mitigated by having a clinician of the same cultural background.

I would have preferred if I was sitting with a Māori, you know because I think a Māori is more likely to be able to make a judgement on the way I react to things and answer things than a Pākehā person would be. ... Their perspective of what I might say maybe absolutely bloody wrong because it has been like that quite a bit in my life. You think they understand. They go, "Yeah, yeah." But, their perception of understanding is not yours.

Sentiments were echoed by a number of participants suggesting that Māori want to be seen by Māori clinicians. The following statement implies that some Māori are no longer accepting of the status quo.

What I'd like to see for Māori is a lot more Māori people working with Māori with injuries because they have that belief, you know our cultural beliefs.

Preferred ways of doing things extended to participants indicating preferences for assessment tools that included Māori content and protocols, such as Māori words in lists requiring memory skills, because they believed this would have encouraged them to perform better.

Yeah, I'd say that if there were some Māori words in there I probably would remember it.

Well if you get other tests from other countries they're going to put their language in it so why can't Māori?

Furthermore, having support people, such as family members, while they were completing a neuropsychological assessment would help lower their

anxiety.

. . . you would open up more if you had a Māori type session . . . just to understand Pākehā [the neuropsychologist] may interpret it wrong just by the sheer difference between the two [cultures] – not prejudice just sheer difference and that just exists, that's a fact.

DISCUSSION

The findings of this study provide some insight into the importance of recognising Māori cultural identity and background when Māori engage with health services such as those provided by neuropsychologists. They make a contribution about the experiences Māori have when required to undergo neuropsychological testing. Recognising a person's cultural identity and being willing to include important cultural practices (for instance, whakawhanaungatanga and karakia) conveys to clients that neuropsychologists are respectful of them as Māori.

Indigenous peoples who have been colonised globally suffer persistent health inequities compared to others living in their respective countries (Bird, 2002; Ring & Brown, 2003; Wexler, 2009). Health inequities are unfair and unacceptable (Braveman & Gruskin, 2003). Contemporary Indigenous health status is located within complex contexts of colonisation, historical traumas (Walters et al., 2011), socioeconomic disadvantage, differential access to determinants of health, and experiences of institutional and interpersonal discrimination (Reid & Robson, 2007). Reducing inequities is important and while many of these factors are beyond individual health professionals' control, the quality of health service delivery is something that neuropsychologists can attend to.

In the last two decades the rapid diversification of the American population has had significant implications for the field of neuropsychology and given rise to a steady body of research leading to a growing awareness and acknowledgement of the role of cultural diversity in cognitive test score disparities (Boone, Victor, Wen, Razani,

& Pontón, 2007; Ferraro, & McDonald, 2005; Loewenstein, Argüelles, Argüelles, & Linn-Fuentes, 1994; Rosselli, & Ardila, 2003). Culturally diverse populations now make up the fabric of many countries, including New Zealand, and the need for cultural competence is even greater as the demand for neuropsychologists to work cross-culturally increases. Alongside this growth, is the emergence of a developing body of evidence providing some understanding of the complex and contentious issue of cross-cultural neuropsychology (Jacobs et al., 1997; Kennepohl, Shore, Nabors, & Hanks, 2004; Manly, Jacobs, Touradji, Small, & Stern, 2002; Pedraza & Mungas, 2008; Razani, Burciaga, Madore, & Wong, 2007; Rosselli & Ardila, 2003; Wong, Strickland, Fletcher-Janzen, Ardila, & Reynolds, 2000).

In New Zealand, little research has been conducted into the complexities of Māori identity and the impact on neuropsychological performance. In the absence of theoretical, evidence-based research, it is even more critical for neuropsychologists in this country to aspire to the highest level of cultural competence in order to mitigate any potential cultural bias in neuropsychological testing. This is in keeping with the principles of the New Zealand Psychological Society's Code of Ethics and The New Zealand's Psychologists Board's guidelines for psychometric testing. Together these documents provide a comprehensive framework for conducting culturally safe and valid psychometric testing. It is thus disappointing that in this study the majority of the neuropsychologists did not consider their client's cultural identity when conducting their assessments.

Culturally responsive practice involves a blend of cultural competence and cultural safety. It requires the establishment of a mutual relationship between practitioners and their clients (Werkmeister-Rozas & Klein, 2009). However, the reality of locating a Māori neuropsychologist is a major problem. The incremental increase, albeit small, in the number of Māori practising psychology in New Zealand has not manifested in the field of neuropsychology. The need for

Māori to be trained in the field of neuropsychology was first realised well over a decade ago (Ogden, 1997), yet at this point in time there remains a critical shortage of Māori neuropsychologists.

In addition to relationships, recognising clients' different worldviews and cultural contexts is central to cultural responsiveness and understanding cultural ways of functioning in their daily life. Within the neuropsychological context, this requires neuropsychologists to identify their own cultural location (including the potential socio-economic differences that may exist between their own social positioning and their Māori client's socio-economic realities), and undertake a critical analysis of their local Indigenous socio-historical realities and how this impacts on their daily lives and life chances (Anderson et al., 2009; Bellon-Harn & Garrett, 2008; Kelly, 2009; Pauly, MacKinnon, & Varcoe, 2009). Culturally responsive neuropsychological assessments require neuropsychologists to work together with Māori clients to optimise a culturally safe and satisfying experience for them. Understanding the negative experiences and inequities in educational performance for many Indigenous peoples (Smith, 2012) and the impact this has on cognitive testing further reinforces the need to acknowledge clients' cultural identity and background.

Yet, despite the growing recognition of cultural diversity within neuropsychology, the majority of assessment instruments, their content and normative data continue to be developed by those who prescribe to the dominant culture. Instrument items are constructed within the dominant culture context on the basis that translated cultural concepts and items have relevance. This is a flawed notion as items and concepts can lack relevance to Indigenous peoples or their meanings may be altered in the translation process, for example (Ardila, 1995).

In this study, we found that Māori wanted to have some choice and a sense of empowerment during their experience. The participants in this study articulated that a lack of information prior to their neuropsychological assessment meant that they did not

know or understand what was expected of them or what was going to happen – it left them feeling disempowered. Furthermore, the participants were generally not consulted when recommendations for rehabilitation were being developed thus exacerbating their feelings of disempowerment and exclusion. Empowerment requires having necessary information and an environment whereby clients feel they are informed and that they have a sense of control. Sohlberg and Mateer (2001) emphasise the importance of empowering individuals and families in the rehabilitation process. When working with families with a member who had a brain injury, Mann (1998) identified 'information and access' as a key empowering factor. Empowerment can be further enhanced by providing information in a way that promotes the health literacy of Indigenous peoples.

Clinical implications

There are a number of strategies that can be undertaken to improve client experiences of neuropsychological assessment. First and foremost, recognising and respecting the importance of clients' cultural identity and background for putting them at ease and enhancing their performance is crucial. Understanding the importance of cultural processes of engagement is crucial for making clients feel less anxious and potentially performing better on cognitive tests. A simple step such as greeting the client in Māori (*kia ora*) may greatly enhance rapport and increase motivation. It is also necessary for contextualising the neuropsychological assessment and establishing the relevance of its outcomes. This may include engaging with extended whanau members and may even necessitate visiting the client at home. Gaining an understanding of the client's environment provides the added benefit of informing rehabilitation recommendations that are relevant and practical for that client and their whanau. Neuropsychologists should consider selecting neuropsychological measures that have been identified as more culturally appropriate with other ethnic minority groups. Furthermore, measures whose normative data has been obtained from heterogenous samples are preferable for use with

Māori than data bases derived from homogenous white groups. Cultural guidance should be sought from Māori who have knowledge of *tikanga Māori*. Neuropsychological services should establish genuine relationships with local *iwi* and *hapū* in order to make neuropsychological process more client-friendly. In some New Zealand towns, *hauora* clinics may provide space for conducting neuropsychological assessments.

An understanding of Māori models of health indicates a respect for a Māori worldview and provides further insight to the needs of Māori clients. Non-Māori neuropsychologists can negotiate with their client the extent of their involvement in the recovery process as part of or in addition to the Māori model of health. The lack of Māori providing neuropsychological assessment services has remained unchanged over the last two decades despite the increasing number of Māori presenting for assessment and their numerous pleas to be seen by a Māori neuropsychologist. In this situation it becomes even more incumbent for non-Māori neuropsychologists to continue to develop their cultural competence.

There is a need for measures that contain culturally relevant material. It has been shown over a number of studies now that Māori want to see content from their own culture integrated into the tests (Ogden et al, 2003; Shepherd, & Leatham, 1999). Not only will this generate feelings of inclusion and empowerment but cognitive performance may also improve because of the familiarity of the material (Diana, Reder, Arndt & Park, 2006; Haitana, Pitama & Rucklidge, 2010). A small New Zealand study (Ogden et al., 2003) showed that Māori performance improved significantly on a test that had been modified to include Māori content, compared to performance on the original version of the test. Māori therefore may be doubly disadvantaged on memory tasks due to (a) unfamiliar content of the material in existing memory tasks, and (b) the lack of Māori content throughout.

Limitations

While there are similarities in experiences with other Māori and Indigenous peoples, and also potentially non-Māori, caution must be taken when

applying the findings of this study to groups and cultural contexts beyond those in this study. Further research is needed on the role of cultural responsiveness in neuropsychologists' practice with Māori. For example, validation studies of the cultural relevance and equivalency of neuropsychological test items when applied with Maori needs further investigation. There is a remote possibility that a participant could have been influenced by the koha provided. However, all participants indicated their motivation for participation in the study was to make a difference for other Māori undergoing neuropsychological assessments.

CONCLUSION

By talking to participants about their experiences with neuropsychological assessments, we have been able to uncover important aspects that would enhance the process of Indigenous peoples, like Māori. Although participants identified positive aspects of the assessment process, specifically their impression of the neuropsychologist, there was clearly disappointment that cultural identity was invisible throughout the assessment process. Fundamental to neuropsychologists' cultural responsiveness is the importance of making clients' cultural identity and background visible and working on how to incorporate cultural practices into the process. Culturally responsive neuropsychological assessments result in more accurate diagnoses, and more relevant and appropriate rehabilitation programmes that lead to better outcomes for those Māori with brain damage, and their whanau.

Acknowledgements:

We would like to thank all the participants who took part in this research and the following organisations for assisting in the recruitment of participants into the study:

Integrated Partners in Health (IPH) - Auckland

XtraPsych Ltd– Whangarei

ABI Rehabilitation New Zealand

The Northern Regional Neuropsychology Peer Group

References

- Agranovich, A. V., & Puente, A. E. (2007). Do Russian and American normal adults perform similarly on neuropsychological tests?: Preliminary findings on the relationship between culture and test performance. *Archives of Clinical Neuropsychology*, 22(3), 273-282.
- Anderson, J., Rodney, P., Reimer-Kirkham, S., Browne, A. J., Khan, K. B., & Lynam, M. J. (2009). Inequities in health and healthcare viewed through the ethical lens of critical social justice: Contextual knowledge for the global priorities ahead. *Advances in Nursing Science*, 32(4), 282-294. doi:10.1097/ANS.0b013e3181bd6955
- Ansari, D. (2012). Culture and education: New frontiers in brain plasticity. *Trends in Cognitive Sciences*, 16(2), 93-95. doi:10.1016/j.tics.2011.11.016
- Ardila, A. (1995). Directions of research in cross-cultural neuropsychology. *Journal of Clinical and Experimental Neuropsychology*, 17(1), 143-150. doi:10.1080/13803399508406589
- Baltes, P. B., & Singer, T. (2001). Plasticity and the ageing mind: An exemplar of the bio-cultural orchestration of brain and behaviour. *European Review*, 9(01), 59-76. doi:10.1017/S1062798701000060
- Bellon-Ham, M. L., & Garrett, M. T. (2008). VISION: A model of cultural responsiveness for speech-language pathologists working in family partnerships. *Communication Disorders Quarterly*, 29(3), 141-148. doi:10.1177/1525740108315879
- Bird, M. E. (2002). Health and Indigenous people: Recommendations for the next generation. *American Journal of Public Health*, 92(9), 1391-1392.
- Boone, K. B., Victor, T. L., Wen, J., Razani, J., & Pontón, M. (2007). The association between neuropsychological scores and ethnicity, language, and acculturation variables in a large patient population. *Archives of Clinical Neuropsychology*, 22(3), 355-365.
- Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Thousand Oaks, CA: Sage.
- Braveman, P., & Gruskin, S. (2003). Defining equity in health. *Journal of Epidemiology and Community Health*, 57(4), 254-258. doi:10.1136/jech.57.4.254
- Brickman, A. M., Cabo, R., & Manly, J. (2006). Ethical Issues in Cross-Cultural Neuropsychology, *Applied Neuropsychology*, 13(2), 91-100.
- Diana, R. A., Reder, L. M., Arndt, J., & Park, H. (2006). Models of recognition: A review of arguments in favor of a dual-process account. *Psychonomic Bulletin & Review*, 13(1), 1-21.
- Durie, M. (1998). *Whaiora: Maori health development (2nd ed.)*. Auckland, New Zealand: Oxford University Press.
- Fallow, B. (2013, November 29). Average income hits \$85K. *New Zealand Herald*.
- Feigin, V., Carter, K., Hackett, M., Barber, P. A., McNaughton, H., Dyall, L., . . . Anderson, C. (2006). Ethnic disparities in incidence of stroke subtypes: *Auckland Regional Community Stroke Study, 2002–2003. The Lancet Neurology*, 5(2), 130-139. doi:10.1016/S1474-4422(05)70325-2
- Feigin, V.L., Theadom, A., Barker-Collo, S., Starkey, N.J., McPherson, K., ...Ameratunga, S. (2013) Incidence of traumatic brain injury in New Zealand: a population-based study. *Lancet Neurology*. 12(1), 53–64.
- Ferraro, F. R., & McDonald, L. R. (2005). More culturally sensitive neuropsychological tests (and normative data) needed. *Alzheimer Disease & Associated Disorders*, 19(2), 53.
- Flick, U. (2002). *Qualitative research in psychology: A textbook*. London: Sage.
- Gergen, K. J. (2010). The acculturated brain. *Theory & Psychology*, 20(6), 795-816. doi:10.1177/0959354310370906
- Grigsby, J., Rosenberg, N. L., & Busenbark, D. (1995). Chronic pain is associated with deficits in information processing. *Perceptual & Motor Skills*, 81(2), 403-410.
- Haitana, T., Pitama, S., & Rucklidge, J. J. (2010). Cultural biases in the Peabody Picture Vocabulary Test-111: Testing tamariki in a New Zealand sample. *New Zealand Journal of Psychology*, 39(3), 24-34.
- Jacobs, D. M., Sano, M., Albert, S., Schofield, P., Dooneief, G., & Stern, Y. (1997). Cross-cultural neuropsychological assessment: A comparison of randomly selected, demographically matched cohorts of English-and Spanish-speaking older adults. *Journal of Clinical and Experimental Neuropsychology*, 19(3), 331-339. doi:10.1080/01688639708403862
- Kelly, U. (2009). Integrating intersectionality and biomedicine in health disparities research. *Advances in Nursing Science*, 32(2), E42-E56. doi:10.1097/ANS.0b013e3181a3b3fc
- Kennepohl, S., Shore, D., Nabors, N., & Hanks, R. (2004). African American acculturation and neuropsychological test performance following traumatic brain injury. *Journal of the International Neuropsychological Society*, 10(04), 566-577. doi:10.1017/S1355617704104128
- King, R. K., Green, A. R., Tan-McGrory, A., Donahue, E. J., Kimbrough-Sugick, J., & Betancourt, J. R. (2008). A Plan for Action: Key Perspectives from the Racial/Ethnic Disparities Strategy Forum [Article].

- Milbank Quarterly*, 86(2), 241-272. doi:10.1111/j.1468-0009.2008.00521.x
- King, M., Smith, A., & Gracey, M. (2009). Indigenous health part 2: the underlying causes of the health gap. *The Lancet*, 374(9683), 76-85.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Lowenstein, D. A., Arguelles, T., Arguelles, S., & Linn-Fuentes, P. (1994). Potential cultural bias in neuropsychological assessment of the older adult. *Journal of Clinical & Experimental Neuropsychology*, 16(4), 623-629.
- Manly, J. J., Jacobs, D. M., Touradji, P., Small, S. A., & Stern, Y. (2002). Reading level attenuates differences in neuropsychological test performance between African American and White elders. *Journal of International Neuropsychological Society*, 8, 341-348. doi:10.1017/S135561770102015X
- Mann, D. W. K. (1998). The empowering of Hong Kong Chinese families with a brain damaged member: Its investigation and measurement. *Brain Injury*, 12, 245-254.
- Ministry of Health. (2010). *Tatau kahukura: Maori health chart book 2010 (2nd ed.)*. Wellington, NZ: Author.
- New Zealand Psychological Society (2002). *Code of Ethics for Psychologists Working in Aotearoa/New Zealand*. Retrieved from the New Zealand Psychologists Board website: http://www.psychologistsboard.org.nz/about/code_of_ethics_2002.html
- Ogden, J. A. (1997). Neuropsychological Assessment in Aotearoa. In H. Love and W. Whittaker (Eds.), *Practice Issues for Clinical and Applied Psychologists in New Zealand*, 293-305. Wellington, New Zealand: New Zealand Government Print.
- Ogden, J. A., Cooper, E., & Dudley, M. (2003). Adapting neuropsychological assessments for minority groups: A study comparing white and Maori New Zealanders. *Brain Impairment*, 4(02), 122-134.
- Ogden, J. A., & McFarlane-Nathan, G. (1997). Cultural bias in the neuropsychological assessment of young Māori men. *New Zealand Journal of Psychology*, 26(2), 2-12.
- Pauly, B. M. P. R. N., MacKinnon, K. P. R. N., & Varcoe, C. P. R. N. (2009). Revisiting "who gets care?": Health equity as an arena for nursing action. *Advances in Nursing Science*, 32(2), 118-127. doi:10.1097/ANS.0b013e3181a3afaf
- Pedraza, O., & Mungas, D. (2008). Measurement in cross-cultural neuropsychology. *Neuropsychological Review*, 18(3), 184-193. doi:10.1007/s11065-008-9067-9
- Razani, J., Burciaga, J., Madore, M., & Wong, J. (2007). Effects of acculturation on tests of attention and information processing in an ethnically diverse group. *Archives of Clinical Neuropsychology*, 22(3), 333-341. doi:10.1016/j.acn.2007.01.008
- Reid, P., & Robson, B. (2007). Understanding health inequities. In B. Robson & R. Harris (Eds.), *Hauora: Maori health standards IV. A study of the years 2000-2005* 3-10. Wellington, NZ: Te Ropu Rangahau Hauora a Eru Pomare. Retrieved from <http://www.hauora.maori.nz>
- Ring, I., & Brown, N. (2003). The health status of indigenous peoples and others: The gap is narrowing in the United States, Canada, and New Zealand, but a lot more is needed. *British Medical Journal*, 327(7412), 404-405. doi:10.1136/bmj.327.7412.404
- Roselli, M., & Ardila, A. (2003). The impact of culture and education on non-verbal neuropsychological measurements: A critical review. *Brain and Cognition*, 52, 326-333.
- Shepherd, I., & Leatham, J. (1999). Factors affecting performance in cross-cultural neuropsychology: From a New Zealand bicultural perspective. *Journal of the International Neuropsychological Society*, 5(1), 83-84.
- Smith, L. T. (2012). *Decolonizing methodologies: Research and indigenous peoples (2nd ed.)*. London: Zed Books.
- Sohlberg, M. M., & Mateer, C. A. (Eds.). (2001). *Cognitive rehabilitation: An integrative neuropsychological approach*. London: Guilford Press.
- Statistics New Zealand. 2013. <http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-culture-identity.aspx>
- Tombaugh, T. (1996). *Test of memory and malingering*. Toronto, ON: Multi-Health Systems.
- Uzzell, B. (2007). Grasping the Cross-Cultural Reality. Uzzell, B., Ponton, M., & Ardilla, A. (Eds.), *International Handbook of Cross-cultural Neuropsychology*. pp 1-21. Mahwah, NJ: Lawrence Erlbaum Associates.
- van der Linden, D., Frese, M., & Meijman, T. F. (2003). Mental fatigue and the control of cognitive processes: Effects on perseveration and planning. *Acta Psychologica*, 113(1), 45-65. doi:10.1016/S0001-6918(02)00150-6
- Wexler, L. (2009). The importance of identity, history, and culture in the wellbeing of Indigenous youth. *Journal of the History of Childhood and Youth*, 2(2), 267-376. doi:10.1353/hcy.0.0055
- Walker, A. J., Batchelor, J., & Shores, A. (2009). Effects of education and cultural background on performance on WAIS-III, WMS-III, WAIS-R and WMS-R measures: Systematic review. *Australian Psychologist*, 44(4), 216-223.
- Walters, K. L., Mohammed, S. A., Evans-Campbell, T., Beltrán, R. E., Chae, D. H., & Duran, B. (2011). Bodies don't just tell stories, they tell histories: Embodiment of historical trauma among American Indians and Alaska Natives. *Du Bois Review: Social Science Research on Race*, 8(1), 179-189. doi:10.1017/S1742058X1100018X
- Werkmeister-Rozas, L., & Klein, W. C. (2009). Cultural responsiveness in long-term-care case management: moving beyond competence. *Care Management Journals*, 10(1), 2-7.
- Wong, T., Strickland, T., Fletcher-Janzen, E., Ardila, A., & Reynolds, C. (2000). Theoretical and practical issues in the neuropsychological assessment and treatment of culturally dissimilar patients. In E. Fletcher-Janzen, T. Strickland, & C. Reynolds (Eds.), *Handbook of cross-cultural neuropsychology: Critical issues in neuropsychology*, 3-18. NY: Springer.

Address for correspondence:

Dr Margaret Dudley, Taupua Waioara Centre for Māori Health Research, Private Bag 92006, Auckland, 1142, New Zealand. Phone +64 9 921 999 Ext. 7408. Fax: +64 9 921 9780. Email: mdudley@aut.ac.nz

Conflicts of interest:

None declared.