Promoting the musculoskeletal health of Indigenous Australians living in rural Communities

Aboriginal health in Aboriginal hands

Volume one

Submitted to the University of Newcastle
For the degree of Doctor of Philosophy
October 2004
Declaration

I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other University or Institution.

(Signed) ___________________________

Dein Vindigni
University of Newcastle
October 2004
Acknowledgments

I would like to thank my supervisor, Dr Janice Perkins, for her guidance and support, particularly at the beginning of this PhD. Janice introduced me to the Indigenous Community with whom she had worked closely over many years. Her knowledge, insights and sensitivity to Indigenous cultural issues lay the foundations for working in this Community. I thank her for her belief in my abilities to undertake the PhD within the Discipline of Behavioural Health.

I would also like to thank the other supervisors appointed to the project in the latter part of the study including Dr Lynne Parkinson, Dr Darren Rivett and Dr John Wiggers.

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Mr Michael Dalton and Mrs Enriquetta Dalton spent countless hours developing the user-friendly database required to input the data from the Community, and with analysis of parts of the data. Dr Simon French assisted in locating references and conducting literature searches. Also Professor Rosalie Hudson for editorial assistance, Professor Ron Laura, Mr Mick Arthur (The General) and Mr Ian Hoad for proofing the thesis and the support, encouragement and help of other colleagues and friends including, Dr Barbara Polus, Dr Bruce Walker, Dr John Duggan, Mrs Carole Duggan, Dr Paul Noone, Ms Kathleen Stacey, Dr Phillip Ebrall, Professor Andries Kleynhans, Mr Marcello D’Amico, Ms Robynne Smith, Ms Maree Keating, Dr Malcolm Powell, Dr Barrie Stokes, Mr Christophe Lecathelinais, Ms Josephine Gwynn, Mr Ivan Levacic, volunteer photographer, Rusty Stewart, Ms Vesna Nedelkovski, Mrs Wendy Byrne and Mrs Michelle Walsh.

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Also, Course Accreditation Consultant Amy Boleszny volunteered much of her time in working through the many bureaucratic hurdles required in the accreditation of the Community-based and owned Sports massage course that forms the basis of the intervention. I would like to extend thanks to Tuesday Browell and the Murray School of Health Education. Tuesday gave of her time to conduct the sports massage training course for Indigenous Health Workers and to see the first group of Aboriginal Health Workers through to graduation. Thanks also to chiropractor, Dr Felicity Redpath, who in many ways, was the inspiration and mentor for this program. Felicity Redpath spent 18 months in Bagong Barrio, Kalookan City, Manila, in The Philippines, living among
the people of the squatter areas, as well as treating them, to become an active part of their lives. People in these communities usually have large families to support, so if a parent becomes ill there is little recourse to health care. As most of the jobs require heavy, physical labour, the incidence of musculoskeletal injury and the resultant pain and impairment is extremely high.

Felicity responded to these striking health needs by developing and then implementing a sustainable clinical massage therapy-training program (with certification) for the health workers in the poorest communities. More than 50 squatter area residents have since graduated as health workers from the six-week intensive training program which Felicity began over seven years ago.

Felicity’s program inspired volunteers from Hands on Health Australia (HOHA), a voluntary health organisation, to seed the training program among Indigenous Australians described in this thesis.

A special thanks also to Cultural Elders, Uncle Neville Buchanan and Uncle Paul Gordon, who not only introduced us to Indigenous approaches to managing pain and disability, but made all aware of the importance of ‘working together at the grass-roots to bring renewed hope and help to all people of Australia working with black and white with a common heart for people and the gift of creation’. The picture which appears at the beginning of the thesis was kindly painted by Rodney Augustine. Rodney is a descendant of the Nyul Nyul people, the traditional guardians of the northern Broome territory in Western Australia. The painting tells of the endless possibilities when black and white people meet on common ground united by common good.

I am also indebted to Julie Bateman and John Woulfe for their ongoing assistance with formatting and computer-related challenges. Julie, in particular, tackled the ongoing challenges of formatting and collating the thesis with tremendous patience, comprehensiveness and expertise.

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I extend my gratitude to the Board of Directors, Administrators and Health Workers at the Durri Aboriginal Corporation Medical Service and the Booroongen Djugun Aboriginal Health Workers College. Without their interest and willingness to collaborate, the study would not have been possible. A special thanks to the Elders of the Community and the many Indigenous people who participated in the study. Many expressed their belief in learning from each other and the practical value of a ‘hands on’ approach to understanding and addressing the needs of their Community.

I would like to thank my wife, Catherine, and children, Daniel and Chiara, for their infinite patience, understanding and support throughout the many nights and weekends consumed by the thesis. In particular to my mentor and closest friend Catherine for sharing the desire to learn from the richness of Indigenous people and culture and to make a practical and positive contribution to the Communities that we have been privileged to meet.

Finally, I would like to dedicate this thesis to my parents, Gino and Frances, my sister Connie and parents-in-law Beryl and Norman Hall. Despite their diverse Italian and Anglo-Celtic origins, they reflect a belief shared by many Indigenous and traditional communities that unity and diversity can co-exist and that, despite our differences, we are all part of each other and have a duty to respect and care for all of creation.
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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<tr>
<td>ACMS</td>
<td>Aboriginal Corporation Medical Service</td>
</tr>
<tr>
<td>AHW</td>
<td>Aboriginal Health Worker</td>
</tr>
<tr>
<td>AHWs</td>
<td>Aboriginal Health Workers</td>
</tr>
<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
</tr>
<tr>
<td>AIN</td>
<td>Assistant in Nursing</td>
</tr>
<tr>
<td>AMS</td>
<td>Aboriginal Medical Service</td>
</tr>
<tr>
<td>ANTA</td>
<td>Australian National Training Authority</td>
</tr>
<tr>
<td>AQTF</td>
<td>Australian Quality Training Framework</td>
</tr>
<tr>
<td>ATSI</td>
<td>Aboriginal and Torres Strait Islander</td>
</tr>
<tr>
<td>AUD</td>
<td>Australian Dollars</td>
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<tr>
<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>CAG</td>
<td>Community Advisory Group</td>
</tr>
<tr>
<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health</td>
</tr>
<tr>
<td>Community</td>
<td>Rural Indigenous Australian Community</td>
</tr>
<tr>
<td>COPCORD</td>
<td>Community Oriented Program for Control of Rheumatic Diseases</td>
</tr>
<tr>
<td>CDEP</td>
<td>Community Development and Education Program</td>
</tr>
<tr>
<td>CSMJMB</td>
<td>Community Survey of Muscle Joint and Bone Conditions</td>
</tr>
<tr>
<td>DALYs</td>
<td>Disability Adjusted Life Years</td>
</tr>
<tr>
<td>DET</td>
<td>The Department of Education and Training</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>HAC</td>
<td>Home and Community Care</td>
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<tr>
<td>HOHA</td>
<td>Hands on Health Australia</td>
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<tr>
<td>HREC</td>
<td>Human Research Ethics Committee</td>
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<td>HSA</td>
<td>Health Schools Australia</td>
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<tr>
<td>HTP</td>
<td>The Health Training Package</td>
</tr>
<tr>
<td>ITAB</td>
<td>Industry Training Advisory Body</td>
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<tr>
<td>ILAs</td>
<td>Integrated Learning Activities</td>
</tr>
<tr>
<td>ITCs</td>
<td>Industry Training Councils</td>
</tr>
<tr>
<td>LBP</td>
<td>Low Back Pain</td>
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</table>
LEC  =  Lower extremity conditions
MCHE  =  The Murray College of Health Education
MTP  =  Musculoskeletal Training Program
OA  =  Osteoarthritis
NACCHO  =  National Aboriginal Community Controlled Health Organisation
NAHS  =  National Aboriginal Health Strategy
NR&MRC  =  National Health and Medical Research Council
NSF  =  National Strategic Framework
NTH  =  North
NTIS  =  National Training Information Service
NTQC  =  National Training Quality Control
NT  =  Northern Territory
NSW  =  New South Wales
QCSHITC  =  Queensland Community Services and Health Industry Training Council
QLD  =  Queensland
RCTs  =  Randomised-controlled trials
RMIT  =  RMIT University
RTO  =  Registered Training Organisation
SA  =  South Australia
TAFE  =  Technical and Further Education
TPAC  =  Training Product Advisory Committee
TRCQ  =  Training Recognition Council, Queensland
UEC  =  Upper extremity conditions
UNI  =  University
VIC  =  Victoria
WHO  =  World Health Organisation
WA  =  Western Australia
YLD  =  Years Lived with Disability
Publications & Conferences
Peer reviewed journals and publications

  Based on Prologue and Chapter one

  Based on Chapter two

  Based on Chapter four

  Based on Chapter five

  Based on Chapters five and six
- Publications & Conferences -


- Editor, Clinical Epidemiology text for postgraduate students. Faculty of Biomedical and Health Sciences and Nursing 1998/99. RMIT University, Bundoora, Victoria.

Non-peer reviewed publications


Presentations at Conferences and Lectures

- Vindigni D
  The prevalence of musculoskeletal pain, impairment and opportunities for managing these conditions in rural, Aboriginal Communities.
  Based on Chapter five.

- Griffen J & Vindigni D
  The prevalence of musculoskeletal conditions among Indigenous people living in rural Australia: an opportunity for health promotion?
  Based on Chapters five and six

- Vindigni D
  Assessing and managing musculoskeletal conditions in a rural, Aboriginal Community.
  School of Chiropractic, RMIT University, Bundoora, Victoria, 17 September, 2003.
  Based on Chapter six.

- Vindigni D
  Assessing and managing musculoskeletal conditions in a rural, Aboriginal Community.
  School of Chiropractic, RMIT University, Bundoora, Victoria, 22 & 24 September 2004.
  Based on Chapter six.
Vindigni D
An introduction to the basic management of muscle and joint pain. Lecture and workshop delivered to members of the Wurrundjeri Aboriginal Community, Shire of Darebin, Victoria, 29 June 2004.
Based on Chapter six.

Vindigni D
Managing musculoskeletal conditions in a rural, Aboriginal Community, Paper to be presented at the Eighth National Rural Health Conference, National Rural Health Alliance, Alice Springs, Northern Territory, 10 to 13 March 2005.
Taken from Chapter six.
Prologue
This thesis was developed through the meeting and intertwining of several histories. They are sourced from Indigenous Communities in the Philippines, rural Indigenous Communities in Australia and the increasingly global development of health promotion in the public health field that has been fostered by the World Health Organisation (WHO). These histories are traced in order to set the context for the thesis, and explain how Indigenous Australian health concepts and health promotion have provided a context and framework for the musculoskeletal prevalence study and the pilot sports massage training course described within it.

**How we became involved with Indigenous Communities**

This study was inspired by the work of Dr Felicity Redpath, a chiropractor and clinical educator who worked in Filipino squatter communities and among Indigenous Filipinos from the rural provinces. Felicity spent 18 months in Manila (Philippines), treating people living in the poorer communities and training resident health workers in the assessment and treatment of the common conditions afflicting people living in this community.

As people in these communities traditionally have large families to support and there is little or no recourse to welfare if illness arises, the provision of effective health care is an ongoing priority. This is particularly true of those with jobs involving repetitive or heavy physical labour (Hemingway, 2004).

Felicity responded to the request to provide a professional and sustainable response to the community’s health needs by collaboratively developing and implementing an accredited clinical massage therapy program for health workers that served the poorest communities. Figures 1 and 2 show a myotherapy (massage therapy) graduate treating a fellow student in Bagong Barrio, Kalookan City, Manila, The Philippines, 1998.

Since the initiation of that program, more than fifty health workers have
Figure 1  Myotherapy (massage therapy) in the Philippines, 1998
Figure 2  The first group of Filipino myotherapy graduates
graduated in the program, which commenced over seven years ago. Of these fifty graduates, ten have full-time employment in professionally run clinics and continue to serve the needs of the poor within their community via voluntary Hands on Health Australia* (HOHA) initiatives.

*Hands on Health Australia (HOHA) is a registered charity that provides voluntary health services and clinical training for health workers where health care is not readily accessible. It was established in 1988 to empower communities that are socially and financially disadvantaged. Clinics have been established in Australia and New Zealand, and are currently being developed in the Asia Pacific region. HOHA provided the volunteers and resources to conduct much of the work of this thesis.

Hands on Health Australia has assisted Indigenous Communities by providing accredited training of Aboriginal Health Workers (AHWs) in clinical skills such as massage and counselling, identified as important priorities by several Indigenous Communities. It provides scholarships for training AHWs.

Felicity’s work was the genesis of the Sports massage course for (AHWs) in Australian Aboriginal Communities.

An invitation from a rural Aboriginal Australian Community
In 1998, Uncle Paul Gordon, cultural Elder of the Brewarrina Community, invited two Filipino graduates of Felicity’s course to attend a HOHA conference in the remote township of Brewarrina, New South Wales (NSW), Australia. The concern shared by Paul and other Elders of the Community was the epidemic of physical, mental and spiritual illness and helplessness that was consuming Community members. ‘The needs are striking. They’re more like what you would see in a Third World country rather than what you would expect in rural and remote Australia. This is the legacy of a people disconnected from the past and poorly connected with the present’ (Personal communication, Gordon, 1998).
Paul tells the story of the old government mission where he was brought up. The town of Brewarrina is a remote NSW community with a population of approximately 1500 people, close to Bourke in north-west NSW. It is also noted as the site of ancient Aboriginal fish traps dating back over 30 000 years.

From ancient times, up to 50 000 Aboriginal people from the tribes of the surrounding areas would regularly come together by the banks of the Barwon River at Brewarrina. The local Aborigines would herd fish downstream into corrals that they had laid within the river system. The fish provided an abundant food supply to visiting tribes. By night the people would gather around the campfires, dance their corroborees and celebrate the gift of life and the earth.

Today, life for many young Aboriginal people is scarred by the despair of knowing that they have lost their culture, their land and their hope. The traditional lifestyle of hunting and fishing is not possible without the land. The land is seen as their mother, the source of all life, and is central to their culture. In Paul’s words, seeing the land bulldozed for farming or dug up for mining, is like a non-Aboriginal person returning to their home to find their own mother lying on the floor, bleeding. The feeling of hurt and of horror is the same in both cases (Personal communication, Gordon, 1998).

At the end of the 19th century, Queen Victoria ordered the creation of missions to protect Aboriginal people from being shot by early settlers. Aboriginal people were rounded up from nearby communities. From these original benevolent intentions, the efforts to ‘civilise’ Aboriginal people soon saw them prevented from hunting, gathering and eating their nutritious bush foods. They were forced to live on the mission and survive on rations of sugar, tea, coffee and refined flour. This diet and its legacy of poor health continue to affect Aboriginal people today. They were forbidden to speak their language, practise their spiritual beliefs or hunt and gather foods. Working for white farmers became their principal occupation. This involved shearing sheep, droving cattle, fencing and picking cotton.

The work was low paid, and often unpaid. It has been described as a type of
legitimised slave labour (Personal communication Gordon, 1998; Personal communication Buchanan, 2001).

Brewarrina was the biggest Australian Aboriginal mission in its day until it was closed in the late 1960’s and, by then, very few people lived a traditional lifestyle or spoke their traditional language (Personal communication Gordon, 1998).

The road to a more hopeful and healthy future for black and white is clearly long and hard. At the gathering in Brewarrina, Uncle Paul urged us to all take ‘small steps towards bringing about real hope and help for all people in this country. A common message in Aboriginal spirituality is the importance of listening and learning from each other wherever we come from or whatever our beliefs are. To share the gifts of creation more fairly, to nurture each other and the land which, like an umbilical cord, sustains us’ (Personal communication Gordon, 1998).

**National Aboriginal forums**

The message conveyed by many Aboriginal Elders and Aboriginal forums throughout Australia is the need for collaboration between Aboriginal and non-Aboriginal people, but also a measure of independence in shaping the future of their communities (Personal communication Gordon, 1998; Personal communication Mumbler, 2000; Personal communication Buchanan, 2001; Li’Dthia Warrawee’a, 2002). Aboriginal people have also recognised the importance of developing an Indigenous health workforce that is both professionally and culturally competent (NAHS, 1994; Training Revisions, 2002).

Aboriginal Health Workers provide the cultural link. They have an intimate understanding of their people’s needs and the trust of their Community (Houston & Legge, 1992; Pacza, Steele & Tennant, 2000; Stringer & Genat, 2004).
Figure 3  A massage workshop run for Secondary School students at Brewarrina, New South Wales (NSW)
The first steps towards the study and Sports massage course

In response to Uncle Paul Gordon’s message to share skills and knowledge, in February 1998, a small group of volunteers gathered in Brewarrina, home to a large remote Aboriginal Community, to learn about traditional Aboriginal approaches to healing with bush medicines from the rainforest. They also trained Aboriginal Health Workers in simple massage techniques to help alleviate the chronic pain and impairment endured by so many Community members who lacked the funds and access to even basic medical services (Figure 3).

Chiropractors, osteopaths and massage therapists visited Brewarrina twice yearly and conducted small workshops in massage in the Aboriginal Medical Service (AMS) as well as providing tactile therapies to the Community. The AMS is a modern and spacious facility with just one nurse and two health workers to provide care to approximately 1 000 Aboriginal people in the district. From these beginnings, Uncle Paul encouraged members of HOHA to learn more about the richness of traditional Aboriginal approaches to healing and, together, to take steps towards understanding and managing the pain and suffering endured by the Community.

The Kempsey Aboriginal Community

The ongoing connection with the Aboriginal Community in Brewarrina acted as the foundation for this thesis conducted in the Kempsey Community. The Kempsey Aboriginal Community, in which the study took place, is located on the mid-north coast of NSW and extends across an area of 3 335 sq kms from the mountain headwaters of the Macleay River in the west behind Bellbrook, to the eastern coastal villages of Crescent Head and South-West Rocks. The Nambucca Shire is in the north and Hastings Shire borders the shire in the south.

The link with the Kempsey Community unfolded through the efforts of Dr Janice Perkins, who assisted as the principal supervisor at the beginning of the study. Janice had previously worked extensively with the Kempsey Community in identifying the broader health needs of Aboriginal people and raising awareness
Figure 4  Aboriginal Health Workers perform sports massage on younger members of the Kempsey Community
for improved health outcomes as part of her doctoral and post-doctoral work (Perkins, 1995). The relationship of trust, respect and collaboration built by Janice was the seed for the musculoskeletal project (Figure 4). Elders and the Board of Directors at the Durri Aboriginal Corporation Medical Service (ACMS) endorsed both the musculoskeletal prevalence study and the pilot Sports massage course, which would act as a model for training AHWs in the culturally appropriate assessment and management of common musculoskeletal conditions affecting their people.

**Listening and learning from each other**

‘You white people keep telling us Aboriginals that we have ear problems. You keep showing us the graphs and the research. You know, I think you mob are the ones with ear problems. We keep saying the same things and you don’t seem to hear’.

Dr Puggy Hunter, Former Chairperson, National Aboriginal Community Controlled Health Organisation, 1999.

Uncle Neville Buchanan, cultural Elder of the Thunghutti and Gumbangirr people (from the Kempsey district), believes ‘The Creator gave us two ears and one mouth so that we could listen twice and speak once.’ When he takes children on bush-tucker tours, he tells them to first pull the cotton wool out of their ears and to put it in their mouths so that they can be quiet and still enough to take in the beauty of creation (Figure 5).

The late Dr Puggy Hunter (NACCHO, 1999) also strongly believed that ‘Caring for each other begins by listening to each other.’ This thesis was the end result of much listening to the thoughts and sentiments expressed by members of the Community, both in preparing for the thesis and in all its aspects, from the pilot study to the principal prevalence study and the Sports massage training program.
Figure 5  Uncle Neville Buchanan, Elder of the Gumbangirr people of the northern Kempsey district, introduces participants to stories and bush medicines of the region
Why Health Promotion?

Some authors have promoted the integration of Indigenous health perspectives, such as traditional healing practices, as part of comprehensive primary health care (Ring, 1998; Durie, 2003).

It has been extensively argued that the need for health promotion among Indigenous populations is of particular priority given that their burden of illness, in general, tends to be worse than that of non-Indigenous peoples (Woollard, 1998; McLennan & Madden, 1999; New Zealand Ministry of Health, 1999; ABS, 2002; Durie, 2003). Durie’s prescription for promoting the health of Indigenous peoples includes capacity building, research, cultural education for health professionals, appropriate (needs-based) funding and resources for Indigenous health, and constitutional and legislative changes (Durie, 2003).

The National Aboriginal Health Strategy (1994) encourages the active involvement of AHWs in all phases of planning health promotion initiatives, including needs assessment, development, implementation and evaluation phases. AHWs have been recognised as the best healthcare providers of culturally appropriate rural health services (Saggers & Gray, 1991; Pacza, Steele & Tennant, 2000) and Aboriginal Medical Services (AMSs) are the preferred access route for the health care delivery undertaken by AHWs (National Aboriginal Health Strategy, 1994).

In-service training for identifying modifiable health risks and the acquisition of clinical skills to manage symptomatic conditions has the potential to provide AHWs with the tools to respond more effectively to the health needs of their Communities (Pacza, 1999). The published research also shows that AHWs provide an effective health intervention for their Communities (Training Revisions, 2002). A grounding in the principles and practice of health promotion strategies accompanied by nationally accredited training in the provision of clinical services have also been broadly advocated as steps towards addressing the health disparities experienced by Indigenous Australians (National Aboriginal Health Strategy, 1994; Durie, 2003).
What are the guiding principles of Health Promotion?

The guiding principles of this thesis were drawn from health promotion theory, which advocates that programs are more likely to be successful when the modifiable determinants of the health problem are well understood, and the needs and motivations of the target community are acknowledged and addressed (Sanson-Fisher & Campbell, 1994; Nutbeam & Harris, 2002). Health promotion has been defined as:

‘The process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well being an individual must be able to identify and realise aspirations, to satisfy needs and to change or cope with the environment’

(World Health Organisation [WHO], 1986).

Defining the problem by identifying the magnitude of the health condition(s) often involves drawing on epidemiological and demographic information as well as an understanding of the Communities’ needs and priorities. According to health promotion theory, the nature and quality of available evidence act as a guide for the choice and design of health promotion activity. Where sufficient evidence is not available, or the evidence is of poor quality, the researcher is required to gain data to offset the identified deficiency in evidence (Tugwell et al., 1985; Hawe, Degeling & Hall, 1990; Green & Kreuter, 1991; Wiggers & Sanson-Fisher, 1998).

It is now well recognised that the ability of individuals to achieve positive health outcomes can be significantly increased by enhancing the competence of the community in which they live to address the broader health issues (Nutbeam & Harris, 2002). Applying health promotion frameworks when planning an intervention with community members can assist in comprehensive planning through identifying options, predicting issues of potential importance, selecting appropriate options, and explaining difficulties that frequently arise in practice (Nutbeam & Harris, 2002). Figure 6 outlines the steps towards promoting the musculoskeletal health of Indigenous people living in rural Communities using a
Collating the evidence
Musculoskeletal conditions are known to be prevalent internationally. There is a suspected high burden of illness in rural, Indigenous Communities. What is the burden of illness, as assessed within a health promotion framework? Is more evidence needed?

Assessing the evidence
How have past studies measured musculoskeletal prevalence in rural, Indigenous Communities? Are adequate, culturally appropriate measures of relevant outcomes available? What would best practice in measurement look like?

Gathering more evidence
What is known about the modifiable musculoskeletal risk factors for rural, Indigenous Communities? What are the Predisposing factors (Knowledge, attitudes, beliefs)? What are the Enabling factors (costs, transport, access to services, culturally appropriate care)? What are the Reinforcing factors (e.g. provision of services)?

Developing a best practice measure
Development and pilot of culturally appropriate and robust measures based on best-practice model from Chapter two (representative sample; sound data; clear definitions; health workers assisting in data collection).

Testing the new measure
Community prevalence study of musculoskeletal conditions and risk factors within one Indigenous Community, using the measures developed in Chapter 4. Validation of measures against current best practice.

Using the evidence
Development and pilot of a culturally appropriate musculoskeletal training program for Aboriginal Health Workers, based on the learnings from Chapters one to five.
Chapter one collates the evidence, by exploring past research on musculoskeletal conditions in the Community setting, and concludes that these conditions are highly prevalent internationally and account for a significant and perhaps under-estimated burden of illness particularly in rural, Indigenous Communities (Muirden, 1997).

A health promotion framework is used to determine whether a sufficient understanding of the burden of illness (i.e., its distribution, severity and determinants) exists from which to develop, implement and evaluate suitable health interventions.

Chapter two asks if adequate, culturally appropriate measures (such as screening surveys and clinical assessments) of relevant outcomes are currently available, by assessing the measures used in past studies, against a model for best practice developed from literature on best-practice measurement in this area. A model for developing an adequate tool is proposed.

Consistent with the health promotion framework, Chapter three asks what is known about the modifiable musculoskeletal risk factors for rural, Indigenous Communities. Contributing risk factors have been explored within the context of predisposing, enabling and reinforcing factors. (Hawe, Degeling & Hall, 1990; Green & Kreuter, 1991).

Predisposing factors may include a characteristic of an individual, community or environment that predisposes to a health outcome. A positive predisposing factor for musculoskeletal health might include knowledge of correct lifting, the importance of physical activity and maintaining ideal body weight. Examples of negative predisposing factors might include belief that pain and discomfort are inevitable or an attitude of being resigned to suffering.

Enabling factors encompass any characteristic of an individual or group that facilitates health behaviour or other conditions affecting health including the
skills that are necessary to attain health. Enabling factors can facilitate ill health (e.g., lack of access to a gym or healthcare providers), or conditions that lead to good health (e.g., musculoskeletal prevention and management advice delivered in a culturally appropriate way by AHWs).

Reinforcing factors have been described as any reward or punishment in anticipation or as a consequence of a health behaviour (e.g., positive reinforcement: ‘You'll feel so much better once you start exercising’, and negative reinforcement: ‘don't have a massage because it may make you worse’ or cultural taboos about receiving any tactile therapy).

**Chapter four** draws on the best practice model elaborated in **Chapter two** to develop measurement processes which include clear definitions of health conditions, culturally sensitive measures and AHWs to assist in data collection. A literature search was conducted to locate survey instruments with applicability in the prevalence study which were then refined by key informant discussions and pilot tested. These measurement instruments are also informed by the modifiable risk factors described in **Chapter three**.

**Chapter five** uses the ‘best practice’ process and measurement instruments developed within previous chapters to measure the prevalence of musculoskeletal conditions, associated disability and modifiable risk factors in an Australian Indigenous Community. The robustness of the screening survey delivered by AHWs is investigated by comparing results with current best practice - a clinical assessment conducted by musculoskeletal health professionals.

The development and pilot of a culturally appropriate musculoskeletal training program for AHWs, based on the learnings from **Chapters one to five**, is described in **Chapter six**.

Throughout this doctoral work, an evidence-based approach is intended, which seeks to utilise assessments, interventions and preventative strategies that improve health outcomes and optimise resource utilisation (Cook et al., 1997).
However, working within the Community setting, when guidelines do exist to inform optimal health promotion and healthcare delivery, these may require flexibility to be adapted to suit the needs of particular communities, such as Indigenous Communities (Couzos & Murray, 1999). This is particularly relevant for rural Indigenous Australian Communities, where there is a lack of evidence in relation to prevalence of conditions and modifiable risk factors. In the absence of published studies, international studies (of varying levels of evidence) were relied on to provide some evidence that could be roughly generalised to Indigenous Australians living in rural Communities (Couzos & Murray, 1999). Then, following the health promotion framework, an iterative process has been used, which meant that in order to achieve the primary aim of this work (an AHW training program), new measures have been developed, and primary evidence has been collected to support both the need for and the nature of the health promotion strategy developed.

The aim of this work is to make a contribution to the health of Indigenous Communities by listening carefully to people and enabling them to discover meaningful solutions to their own health needs. It is a small step to promoting the musculoskeletal health of Indigenous people living in rural Australia. It recognises the value of assisting AHWs in formulating culturally sensitive and sustainable training programs on their terms as a necessary step towards achieving meaningful and productive musculoskeletal health outcomes.
Synopsis
To date, there has been only limited research investigating the musculoskeletal health of Indigenous Australians (Vindigni, Blunden & Perkins, 2003). The paucity of research in this area is of concern as the pain and disability associated with musculoskeletal conditions are thought to be high (Vindigni, Blunden & Perkins 2003).

This thesis reports on the outcomes of a cross-sectional survey and clinical assessment designed to measure the prevalence of musculoskeletal conditions, and uses them to inform a community-based musculoskeletal training program for Indigenous Australians living in a rural Community in New South Wales (NSW). The majority of Indigenous Australians live in rural Communities (ABS, 1998a) and the Community studied represents one of the largest rural Indigenous Communities in Australia (ABS, 1998b).

This synopsis covers an explanation of the ethical considerations, the methodology utilised in the study and an overview of each chapter. In this thesis the term ‘Indigenous’ is based on the definition described by the Department of Aboriginal Affairs in 1981. This definition suggests that an Indigenous person is one who is of Aboriginal descent and who both personally identifies himself/herself as Indigenous and is also accepted as Indigenous by his/her Community. Where the capitalised word ‘Community’ appears throughout the thesis, it refers to a rural, Indigenous Australian Community and where the word ‘Indigenous’ is capitalised it refers to indigenous Australians.

The two separate community-based studies comprising this thesis were subject to ethics committee consideration. The first study piloted the research tools, then measured and assessed the prevalence of musculoskeletal conditions, associated risk factors and barriers to managing these conditions in the Community. The second study assessed the cultural acceptability of a musculoskeletal training program (MTP), as well as piloting an approach to assessing changes in skills and knowledge of Aboriginal Health Workers.
(AHWs) who participated in the MTP. This project was a collaborative initiative between the Durri Aboriginal Medical Service (AMS), Booroongen Djugun Aboriginal Health College and the School of Medical Practice and Population Health, Faculty of Health, The University of Newcastle. The collaborative nature of this initiative was in response to current thinking in Indigenous health, that the drive and direction for changes to Aboriginal health must come from within Aboriginal Communities (Houston & Legge, 1992).

The guidelines prepared by the National Health and Medical Research Council (NH&MRC, 1999) on ethical matters in Aboriginal research were consulted throughout the development of the survey, clinical assessment, data collection and intervention phases of the project. In accordance with these guidelines, AHWs were recruited from the participating Community (NH&MRC, 1999), and were trained and employed under the auspices of the AMS. Ethics approval to undertake all aspects of the studies reported in this thesis was obtained from three sources: Community representatives (via the Durri AMS Board of Management); the Human Research Ethics Committee (HREC) of The University of Newcastle; and on an individual basis from participating Community members.

**Chapter one** of this thesis provides a definition of the musculoskeletal conditions under investigation. The focus is on musculoskeletal conditions of mechanical causes (such as osteoarthritis [OA]) and non-specific origin, as these have been described as the most significant causes of pain and disability (Volinn, 1997). This chapter broadly explores the implications of musculoskeletal conditions in terms of the physical, emotional and economic burdens they impose. Indigenous people are the focus of this thesis because of their poor health status in Australia. Although they experience poor health in general, this includes health burdens associated with musculoskeletal conditions. Indigenous people living in **rural** Communities are the particular focus due to the evident health disadvantage in these Communities (McLennan & Madden, 1999) and because a substantial proportion of Indigenous Australians live in rural regions (ABS 1998a).
**Chapter two** systematically reviews the literature on past research to assess the global prevalence of musculoskeletal conditions (and related risk factors) among Indigenous people, including those living in rural Australian Communities. The available literature provides some evidence of a high prevalence of musculoskeletal conditions in these Communities. It was found, however, that many musculoskeletal prevalence studies have significant methodological flaws that may limit the ability to generalise their findings to broader rural, indigenous populations, as also noted by previous authors (Volinn, 1997). These limitations and strategies to address them are discussed. The findings of the systematic literature review were used in the development of a revised model for minimum level methodological considerations for conducting musculoskeletal prevalence studies in Communities. The best-practice guidelines developed from this chapter assisted in conducting the musculoskeletal prevalence study described in **Chapter five**.

**Chapter three** explores opportunities for the prevention and management of musculoskeletal conditions based on the available literature. According to classic health promotion theory, health promotion practitioners should incorporate research evidence in the planning and implementation stages of health promotion interventions (Green & Kreuter, 1991; Sanson-Fisher & Campbell, 1994). Health promotion theory provides a systematic, evidence-based approach for developing and effectively applying health interventions. The chapter outlines the various risk factors that have been identified for musculoskeletal conditions, and describes how addressing these factors via culturally appropriate health interventions presents an opportunity for disease prevention and health promotion. This chapter also reviews the literature for the barriers associated with the management of musculoskeletal conditions. Taking risk factors, barriers and opportunities for management into consideration simultaneously may have the potential to reduce morbidity and costs to the health sector, particularly if this approach is widely implemented. These reviews provided the basis for developing and piloting a Community-based, clinical intervention, which is described in **Chapter six**.
Chapter four describes the development of measures for assessing the prevalence of musculoskeletal conditions, the associated risk factors and barriers to managing these conditions for people living in this Community. In keeping with health promotion theory, the need to develop these measures arose from a lack of existing reliable and valid measures suitable for use in Indigenous Communities (Green & Kreuter, 1991; Sanson-Fisher & Campbell, 1994). The development of a screening survey and clinical assessment protocol was based on a literature search, existing validated measures, feedback from Indigenous key informants and pilot testing with Indigenous people in order to achieve cultural appropriateness.

Chapter five reports the results of a cross-sectional survey of the prevalence of musculoskeletal conditions and associated risk factors among Indigenous people living in one of the largest rural Communities. The study was based on the best-practice model outlined in Chapter two and informed by the risk factor literature search performed in Chapter three. The measures were refined via Community-based discussions and pilot testing for their cultural acceptability, as described in Chapter four.

The methodology combines an AHW administered survey and a clinical assessment that is performed by chiropractors in order to validate the screening survey according to clinically accepted parameters for the chiropractic profession. The survey was found to be a valid and culturally acceptable screening tool when compared with expert clinical assessment. It may therefore prove useful as a screening instrument for recording prevalence estimates among Indigenous Australians in other rural Communities.

The prevalence study revealed that low back pain, followed by neck, shoulder and knee pain, appeared to be most prevalent in this Community. The most commonly associated dietary and lifestyle factors included obesity, lack of physical activity, smoking, physical trauma and psychosocial stresses. Occupational risk factors included adopting awkward postures at work, prolonged sitting, frequent bending and twisting and heavy lifting.
Chapter six describes the development and implementation of a preliminary Community-based intervention (the MTP) delivered by AHWs that responded to the outcomes of the prevalence study. This intervention attempted to incorporate both modifiable risk factors (to facilitate the prevention of musculoskeletal conditions) and opportunities for managing the most prevalent musculoskeletal conditions, primarily in the form of tactile, massage therapies. The emphasis of this Community-based approach was to promote sustainable and culturally sensitive health care delivery.

The MTP was collaboratively developed over a two-year period with the Durri AMS, The University of Newcastle, Booroongen Djugun Aboriginal Health College and Hands on Health Australia (HOHA). The course was accredited according to the guidelines of the Department of Education and Training (DET), Queensland. This system of on-site training was found to be advantageous for AHWs given the flexibility of its delivery. It offered recognition of prior learning attainment (i.e., other relevant subjects such as first aid, occupational health and safety, anatomy and physiology), and an opportunity for students to use existing skills and knowledge as a basis for more advanced studies.

Beyond addressing the most prevalent musculoskeletal conditions which included low back pain, neck pain and headaches, shoulder pain and knee pain, the accredited course acknowledged cultural sensitivities by incorporating Indigenous approaches in the management of musculoskeletal conditions. It also affirmed the value that the Community attached to sport. The program respected the traditional knowledge and experience of both Elders and AHWs in promoting the health of their own Community (Li’Dthia Warrawee ’a, 2000).

The MTP was piloted, and changes to skills, knowledge and attitudes of AHWs were assessed, via ongoing assessment protocols consistent with didactic methods used in the training of AHWs. Whilst the sample size of twenty participating health workers was relatively small, post-intervention improvement in the skills and knowledge of AHWs in relation to sports massage skills and knowledge, as well as an understanding of modifiable risk factors, was demonstrated. Importantly, the MTP was shown to be a culturally acceptable
step towards promoting the musculoskeletal health of Indigenous people living in this rural Community.

Chapter seven discusses the conclusions from these two studies, and highlights the poor musculoskeletal health status of Indigenous Australians living in rural Communities. The conduct of these studies reiterates the difficulties associated with conducting studies in Indigenous Communities according to mainstream concepts, which rely on randomly selecting participants in order to achieve generalisability to the larger population. Other researchers in this field have emphasised the challenge of collecting data from a population that is frequently mobile and transient.

The conclusion also acknowledges that major changes to the underlying social and economic determinants of musculoskeletal health must occur in order to achieve significant improvements. It was, however, beyond the scope of this doctoral work to pursue this further, other than to note that such changes would include improved food and nutrition, housing, education and employment, as well as health promotion. Other researchers and writers also identify and advocate such changes (Personal communication Gordon, 1998; Li’Dthia Warrawee’a, 2000; Durie, 2003).

Beyond empowering Indigenous people through sustainable, Community-based training initiatives, lies the immediate need to improve access to musculoskeletal health services and to remove this current and considerable barrier to improving the musculoskeletal health of Indigenous Australians.

The conclusions of this thesis highlight the importance of giving consideration to cultural sensitivity and collaboration in planning health service delivery to Indigenous people. The application of the Community-based model used in this study may have the potential to be seeded in Communities throughout the country as a step towards promoting the musculoskeletal health of Indigenous people living in rural Australia and beyond.