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ORIGINAL RESEARCH

Evaluation of a pharmacist-led, medicines education program for Aboriginal Health Workers

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ABSTRACT

Introduction: The health of Indigenous Australians is exceptionally poor compared with that of non-Indigenous Australians. Cardiovascular diseases are the leading cause of death, the death rate being at least 2.7 times higher than the total Australian population. Indigenous Australians also experience underutilisation and reduced quality use of medicines. Aboriginal Health Workers (AHWs) are appropriate members of the healthcare team to provide information about medicines to the Indigenous community. However, despite having an expanding role in medicines management, AHWs have reported they do not have adequate appropriate education to support this role. Community pharmacists in localities with high Indigenous populations are well placed to provide medicines education to AHWs; however, to be successful in this role they need to develop their cultural awareness. The purpose of this study was to evaluate a culturally appropriate, pharmacist-led cardiovascular medicines education program for AHWs. Research questions included: What was the impact of the program on the pharmacists? What were the barriers and facilitators? Was the program useful and acceptable to the AHWs?

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Methods: Four educational units were developed in collaboration with AHWs. A purposive sample of community pharmacists from western New South Wales (NSW) attended training involving instruction in the delivery of the program and cultural awareness training. The pharmacists then recruited local AHWs and delivered the program. Evaluation, with respect to the pharmacists, involved a repeated measures, three-phase questionnaire and semi-structured, face-to-face, in-depth interview post-program. Feedback was obtained from the AHWs in the form of a brief survey, and an audit of the attendance at each session was performed.

Results: Twelve pharmacists in 10 localities throughout western NSW delivered the program to a total of 47 AHWs. Statistically significant differences in the questionnaire responses, as a result of delivering the education, indicated the pharmacists felt better equipped to deal with Indigenous health issues ($p = 0.002$, Mann-Whitney *U*-test); they knew more AHWs in their area ($p = 0.005$, Mann-Whitney *U*-test); they felt more confident as educators of AHWs ($p = 0.007$, Mann-Whitney *U*-test); and more confident that they had the necessary resources to deliver this education ($p = 0.005$, Mann-Whitney *U*-test). The semi-structured interviews revealed that the experience of delivering the education improved pharmacists' confidence as educators and motivated them to develop sustainable relationships with AHWs. A significant barrier lay in the challenges associated with organizing the AHW education sessions, while an important facilitator was prior established relationships with local Aboriginal health services. Evaluation with respect to the AHWs revealed the program reached 80% ($n = 47/59$) of AHWs within the western NSW region. In total, 46% ($n = 27$) of AHW participants attended all four educational units and attendance at each educational unit was above 78% ($n = 37$) throughout. The AHWs reported that they found the program interesting and relevant and were enthusiastic for future collaboration with the pharmacists.

Conclusions: The desire to develop sustainable relationships was seen by all participants as the most positive aspect of the program.

Key words: Aboriginal health workers, cardiovascular medicines education, community pharmacy.

Introduction

The health of Indigenous Australians significantly lags behind that of the Indigenous populations of other countries and is exceptionally poor in comparison with the health of non-Indigenous Australians[1-3]. Cardiovascular diseases are the leading cause of death and the death rate from these conditions is 2.7 to 3.2 times higher than in the total Australian population[4]. A complex interplay of historic, socio-economic and cultural issues has contributed to this poor health status and has led to reduced access to health resources, such as essential medicines, for Indigenous Australians[1,5-7].

An Indigenous Australian has been defined as 'a person of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal or Torres Strait Islander, is recognised and accepted as such by the community in which he or she is associated'[8]. Today, people who identify as such comprise 2.5% of the total Australian population, with 32% living in major cities, 43% in regional centers and 25% in remote areas[9]. New South Wales (NSW) has the largest total population of Indigenous people at 29.4%, 15% of whom (22 271 people) live in rural or remote areas[9]. Some live in separate communities in the more remote areas, while many live integrated into the rural towns and regional centres.

Sub-optimal use of medicines

Underutilization of medicines through lack of access to essential health resources contributes to the poor health status of Indigenous Australians[2,10]. Medicines are considered first line treatment for all common causes of

morbidity and mortality suffered by Indigenous Australians, and have resulted in a 50% reduction in mortality when used within an Indigenous primary health setting[11]. The Indigenous per capita spending on medicines through the Pharmaceutical Benefits Scheme is two-thirds less than non-Indigenous spending[2,7] despite a national government policy to provide access to medicines for all Australians[12].

The primary reasons behind this underutilization of medicines stem from socioeconomic disadvantage[2]. Other contributors include long distances to pharmacies and/or medical services, difficulties in obtaining transport, the cost of medicines and the paternalistic nature of some health services[10].

A number of significant advances towards improved health care have been made recently. Three significant and successful strategies have included the development of Aboriginal Community Controlled Health Organisations, the implementation of the S100 medicines scheme, and the expanding the role of Aboriginal Health Workers (AHWs), all of which have contributed to improving the accessibility and appropriateness of healthcare for Indigenous Australians.

Aboriginal Community Controlled Health Organisations

Aboriginal Community Controlled Health Services are an example of an integrated primary healthcare model providing culturally safe, community directed services that initiate, plan and deliver relevant health care within a governance structure[1]. They are based on the concept that consultation with Aboriginal communities is critical to successful healthcare delivery[4,13]. The major aims of these services are to provide holistic, culturally relevant services that address the physical, spiritual, social and emotional wellbeing of Indigenous Australians[1]. There are currently in excess of 100 Aboriginal Community Controlled Health Services in Australia[1,4]. Positive attendance figures and high satisfaction ratings in other countries indicate that these services are highly effective in responding to Indigenous health needs and have contributed to health gains[14].

Implementation of the S100 Scheme

Another successful strategy has been the implementation of the S100 Medicines Scheme under S29 legislation of the *National Health Act 1953*. The scheme was introduced in February 1999 and allows for the supply of free medicines to remote Indigenous communities where they cannot be conveniently and effectively supplied through the Pharmaceutical Benefits Scheme or Medicare[5,10]. The S100 Scheme has reportedly benefited 36.7% of the Indigenous Australian population[15].

Unfortunately, the S100 Scheme is not available in non-remote areas despite the lack of access to medicines in Indigenous communities being independent of remoteness[16]. Moreover 74% of Indigenous Australians do not currently live in remote regions and hence cannot benefit from S100[4]. There has been some suggestion to widen the S100 Scheme to incorporate non-remote regions, but this has not occurred to date[5] and so Indigenous people in non-remote areas must access medicines through mainstream community or hospital pharmacies, many of which they feel uncomfortable approaching for historical and cultural reasons[6].

The expanding role of Aboriginal Health Workers

Aboriginal health workers are pivotal members of Aboriginal Community Controlled Health Services[1,5]. They perform a broad range of clinical and social services, primarily for Indigenous Australians, while working towards ensuring cultural safety and effective communication is established between Indigenous Australians and mainstream healthcare professionals[5,6,13,17]. Aboriginal Health Workers may also be employed to perform similar tasks for Indigenous Australians within the mainstream health services provided through state governments, either in hospitals or community health clinics. These health services

may also employ non-Indigenous health workers to assist in these areas.

Currently AHWs are considered most appropriately placed to provide medicines to the Indigenous community[18]. This is because they are on site and can bridge the cultural and communication gap between Indigenous Australians and the mainstream healthcare system and, hence, effectively relay critical information about medicines to their Indigenous clientele[18]. The extent of their responsibility is determined by the legal and administrative requirements of their place of employment, and may range from simple administrative functions to the prescription and supply of some medicines to members of their community[17].

Medicines education for Aboriginal Health Workers

Recently AHWs have reported an expanding role in medicines management[5,6] and, despite numerous accredited educational courses being available[18,19-21], have stated that they lack the knowledge or skills to support their expanded role. They have suggested that they need additional education[6] as they currently have variable skills and knowledge, largely based on individual experience.

Seven key factors have been identified as contributing to positive educational outcomes for Indigenous Australians, including: community ownership and education; incorporation of Indigenous identities, culture, knowledge and values; establishment of sustainable partnerships; flexibility of course design, content and delivery; staff who are committed to advocacy; extensive student support services; and appropriate funding that allows for sustainability[22,23].

Recently, community pharmacists have performed promisingly as educators within a disease state management framework[24,25]. Due to their accessibility and expert knowledge in medicines, pharmacists in localities with high Indigenous populations are potentially well placed to provide medicines-based education to AHWs[5]. However since the majority of pharmacists in Australia have a non-Indigenous heritage, their participation in a two-way learning approach in which they become cultural learners from Indigenous people is crucial to their potential effectiveness as educators in this context[22].

In 2003 and 2004 two academic pharmacists (and members of the project team) were situated in central western NSW, on the Orange campus of the University of Sydney and teaching in the Bachelor of Pharmacy (Rural). During that time they developed strong links with the AHWs in the area, particularly those involved with education of the Indigenous health workforce. In 2004, a research student from the Faculty of Pharmacy conducted interviews with those health workers to explore their experience of the use of prescribed medications within the communities served[6]. That study also explored possible strategies for improving medication use within those communities, and one strong request from the health workers was for the delivery of medication education seminars by pharmacists.

Further research conducted in the same area with pharmacists in 2006 revealed that rural/remote community pharmacists were willing to deliver medicines education to AHWs in their area but, at that time, they had little contact with those workers[26]. As a consequence, in 2005, with the support from the area Director of Workforce Development, the Area Aboriginal Health Co-ordinator and Education Officer and the Chief Executive Officer of Orange Aboriginal Medical Service, the two academic pharmacists applied successfully for a grant through the Rural Health Support and Training Scheme to develop a medicines education program.

This project aimed to:

- strengthen health professional networks by building partnerships between pharmacists and AHWs
- provide a new training role for pharmacists, particularly in the management of cardiovascular disease

- result in pharmacists working with their local AHWs to deliver key messages to the rural and remote Indigenous community.

To date, no studies have evaluated a pharmacist-led medicines education course for AHWs. Hence, the purpose of the study presented here was to evaluate a cross-cultural, pharmacist-led cardiovascular medicines education program for AHWs in terms of the following research questions:

- What was the impact of the program on the pharmacists?
- What were the barriers and facilitators?
- What were the suggested future strategies?
- Did the AHWs find the program acceptable and useful to their role?

It was beyond the scope of the current project, both in time and funding, to evaluate the effectiveness of the program in terms of AHWs' knowledge about medicines or changes in health outcomes. Nevertheless, the information gained here may be useful to provide direction for future studies aiming to measure these outcomes.

Methods

Ethics approval was obtained from the Human Research Ethics Committee of the University of Sydney, NSW for the evaluation. The cross-cultural pharmacist-led cardiovascular medicines education program for AHWs consisted of five stages, the fifth involving the present evaluation.

Stage 1: Development of educational material

The two academics, with input from the key Indigenous people in central western NSW, then developed the cardiovascular medicines resource (Fig1). The education component was divided into four units: (i) 'All About Medicines'; (ii) 'Cardiovascular Health'; (iii) 'High Blood Pressure'; and (iv) 'Lipids and Lipid-lowering Medications', with each unit anticipated to take one and a half hours to deliver.

Stage 2: Recruitment of pharmacists

Although the program could have been delivered by the academic pharmacists the study was designed to involve the community pharmacists so that sustainable local relationships could be developed. A sampling frame of community pharmacists working in western NSW in communities with an Indigenous population large enough to warrant employing at least one AHW was used to select a sample of participants for inclusion in the study. The region of western NSW was chosen due to the rural/remote nature of some of the communities[27], a higher than average Indigenous population[28-36] and because links had been established previously with key AHWs in the area[6,37]. Eligible pharmacists were initially contacted by telephone and all who displayed an interest were included in the sample. A letter explaining the study objectives, and the details of a pharmacist-education weekend, including written informed consent, was sent to the sample pharmacists.

Stage 3: Pharmacist education weekend

A pharmacist education weekend was held in Dubbo, NSW in November 2006. Culturally appropriate teaching strategies to assist the effective delivery of the AHW education program were delivered by the pharmacy academics and a 4 hour cultural awareness session was delivered by an experienced Aboriginal trainer. The pharmacists were then provided with relevant program resources (Fig1) and the offer of on-going support from the project team. No formal evaluation of the pharmacists' ability to deliver the material was conducted but most of the pharmacists were well known to the project team because they had participated in projects run by the Faculty of Pharmacy previously. In two cases a recently graduated pharmacist was teamed with a more experienced pharmacist.

1. Cardiovascular medicines AHW education program: CD ROM
    a. using Microsoft Office PowerPoint presentations
2. Cardiovascular medicines AHW education program: workbook
    a. using Microsoft Office PowerPoint presentations
3. Medicines Book for Aboriginal Health Workers
4. Australian Medicines Handbook
5. Cardiovascular medicines AHW education program: board game
6. Measures for establishing understanding of educational concepts
    a. Pre–post self tests for each educational unit (incorporated into the workbook)
    b. Group discussion questions (incorporated into the board game)

AHW, Aboriginal health worker

Figure 1: Resources provided to the pharmacists for the Aboriginal Health Worker (AHW) education program.

Stage 4: Aboriginal Health Worker education program

After the training the project team contacted all the relevant managers of the AHWs to update and inform them in detail about the project. The managers were advised that their local pharmacist would be in touch with them to arrange the sessions for their staff but that participation was voluntary. From February 2007 to July 2007 participating pharmacists were required to recruit local AHWs from their community, organize suitable times and venues for delivery of the AHW education program and deliver the education within the six-month period. While it would have been desirable to have the collaborating Indigenous staff involved in the delivery of the program, this was not possible given the time commitment required and the distances to be travelled for staff already over-stretched.

Stage 5: Program evaluation

Research design and data collection: Program evaluation occurred in the period July 2007 to September 2007. To gain participants' perspectives of involvement in the project, a brief questionnaire was administered to pharmacists, a semi-structured, face-to-face, in-depth interview was conducted with each pharmacist after delivery of the program, and a feedback survey was administered to the AHWs (Table 1). In addition, brief demographic details of the participants and their respective localities were collected and the attendance and employer of the AHWs were obtained by the pharmacists at each session. This mixed methods research design was chosen to account for the perspectives of all participants and to identify patterns of convergence in results[38].

Repeated measures, three-phase questionnaire for the pharmacists: This questionnaire was administered in three stages to elucidate the comparative effects that attending the pharmacist education weekend and delivering the AHW education program had on the pharmacist responses to the seven program-specific statements contained within it (Table 2). Responses were gauged on a five-point Likert scale using 'strongly agree' (1), 'agree' (2), 'neutral' (3), 'disagree' (4) and 'strongly disagree' (5). The questionnaire was administered anonymously to minimise any sensitive issues relating to Indigenous health and/or the small group size.

Semi-structured, face-to-face, in-depth interviews with the pharmacists: These interviews were conducted on completion of the program to obtain a deeper understanding of the pharmacists' perceptions of their involvement in the program. The interview guide consisted of 20 open-ended questions that were themed in line with the study objectives (Fig2).

Table 1: Research evaluation tools

Evaluation tool	Who the method was delivered to	Delivery context
Repeated measures, three-phase questionnaire	Pharmacist (anonymous)	1. Before pharmacist education weekend ('before') 2. After pharmacist education weekend ('middle') 3. After AHW education program ('after')
Semi-structured, face-to-face, in-depth interviews	Pharmacists	On completion of AHW education program. Performed by a single interviewer and audio taped.
Feedback survey	AHWs (anonymous)	On completion of AHW education program. Delivered by participating pharmacists.

AHW, Aboriginal health worker.

Table 2: Repeated measures, three-phase questionnaire for the pharmacists

Statement	Median score (IQR)			*P*-value[¶]	Location of significance[§]
	Before *n* = 12	Middle *n* = 14	After *n* = 12		
I have a good understanding of Indigenous health issues.	2.5 (2–4)	3.0 (2–4)	2.0 (2–3)	0.243	No significant change
I feel well equipped to deal with Indigenous health issues.	4.0 (3–4)	4.0 (2.8–4)	2.0 (2–3)	0.000	• Before–middle: $p = 0.934$ • Middle–after: $p = 0.002$
I have a good understanding of cardiovascular medicines.	2.0 (2–3)	2.0 (2–2.3)	2.0 (1–2)	0.112	No significant change
I know the Aboriginal Health Workers in my area.	2.5 (2–4)	2.5 (2–4)	2.0 (1–2)	0.009	• Before–middle: $p = 0.935$ • Middle–after: $p = 0.005$
I feel confident to train my local Aboriginal Health Workers about cardiovascular medicine.	2.5 (2–3)	2.0 (2–3)	2.0 (1–2)	0.014	• Before–middle: $p = 0.712$ • Middle–after: $p = 0.007$
I am keen to help my local Aboriginal Health Workers to conduct a community forum about cardiovascular health.	1.0 (1–2)	2.0 (1–2)	2.0 (2–2)	0.148	No significant change
I have all the resources necessary to train my local Aboriginal Health Workers.	4.0 (3–4)	3.0 (2–4)	2.0 (2–2)	0.001	• Before–middle: $p = 0.151$ • Middle–after: $p = 0.005$

[¶]Performed with Kruskal-Wallis *H* test for three independent groups (significance at $p<0.05$). [§]Performed with Mann-Whitney *U* test (significance at $p<0.05$).
IQR, Interquartile range.

Descriptive details of the AHW education program
Pharmacist impressions about the content and delivery of the program
Resources: their content and use
Barriers and facilitators
Relationship development between pharmacists and AHWs
Future suggested strategies

AHW, Aboriginal health worker.

Figure 2: Question themes for semi-structured, face-to-face, in-depth interviews with the pharmacists. AHW, Aboriginal Health Worker.

A single interviewer who adopted a standardised approach to each interview to minimise bias performed the interviews[39]. All interviews lasted approximately 40 min. The interviews were audiotaped with the consent of the pharmacists.

Feedback survey for the Aboriginal Health Workers: Although a full evaluation from the health workers' perspective and a test of knowledge gained by the health workers was desirable, it was decided, after consultation with the relevant ethics committees and discussion with the key Indigenous managers, that simple feedback in terms of a brief survey after the education sessions would be more appropriate and less daunting for participants. The aim of this brief feedback survey was to elicit the AHWs' views on the education program. It involved six statements measured on a five-point Likert scale using 'strongly agree' (1), 'agree' (2), 'neutral' (3), 'disagree' (4) and 'strongly disagree' (5). It also contained written open-ended questions to encourage further comment on their education. This survey was administered anonymously to minimise any sensitive issues relating to Indigenous health and/or the small group size. The pharmacists administered it to the AHWs immediately after the final education unit and completion of the feedback survey was voluntary.

Data analysis

Pharmacist questionnaire: Normality tests for the response data were conducted using the Kolmogorov-Smirnov test[40]. The difference across time between the three sets of non-parametric data was assessed by analysis of variance by ranks using a two-tailed Kruskal-Wallis *H*-test, at a 5% ($p<0.05$) significance[40]. When a significant difference was detected by this approach, the Mann-Whitney *U*-test for independent, non-parametric groups was used to evaluate where the change occurred, at a 5% ($p<0.05$) level of significance[40].

Pharmacist interviews: The audio taped interviews were transcribed verbatim and entered into QSR NVivo software (QSR International; Melbourne, VIC, Australia), a software package that assists in managing qualitative data. Interview responses were coded into categories using an iterative approach then thematically content analysed. The themes were validated by an independent researcher against the original transcripts[39].

Aboriginal health worker feedback survey: An audit of frequency distributions of the responses to each statement was used to analyse the data derived from the survey.

Aboriginal health worker attendance: Sessions were audited for the total number of AHWs attending, the number attending each educational unit and the respective employers of each AHW.

Data analysis was performed using SPSS 14.0 for Windows (SPSS Inc; Chicago, IL, USA).

Results

Participants

Pharmacists: Twenty-one community pharmacists from western NSW were eligible for inclusion in the study. Five pharmacists declined to be involved in the project upon initial telephone contact. Two pharmacists who initially expressed interest were not able to undergo the pharmacist education program due to ill health. Two pharmacists completed the education but did not deliver the AHW sessions because of family circumstances or difficulties in finding time to deliver the program. Thus twelve of the eligible pharmacists (57%) delivered the pharmacist-led 'cardiovascular medicines education program'.

Of the 12 pharmacists who participated, eight were female, eight had been practising as a community pharmacist for more than 10 years, seven were salaried employees and five had a business interest in the pharmacy in which they worked. Demographic characteristics of the respective

localities of each pharmacy involved in the project are displayed (Table 3).

Aboriginal Health Workers: Within the communities of the 12 pharmacists who delivered the program, there were a total of 59 AHWs employed in the area[41]. All managers were keen to have their staff participate in the program but it was not compulsory for any to do so. At follow up a total of 47 AHWs (80%) had attended some of the training units and 27/59 (46%) had attended all four units. Of these, 24 (51%) were employed by the Aboriginal medical service, 20 (42%) were employed by the community health service, and three (6%) were employed by both organizations.

Delivery of the Aboriginal Health Worker education program

The AHW education took place at 10 sites because in two cases two pharmacists conducted the sessions together. The length of time that each unit took ranged from 30 min to 1.5 hours (the majority taking 1.5 hours) and depended on the number in the group and the unit/s being covered. Seven sites used the workplace of the AHW to conduct the sessions. The relative frequency of use of the resources provided to the pharmacists is outlined (Fig3). Some groups were larger than others, and because the sessions were very interactive there was not always time to use every resource in the session time. However, a copy of all resources was left with each group of AHWs for future reference and AHWs were awarded a certificate acknowledging their participation in all the sessions they attended.

Repeated measures, three-phase questionnaire for pharmacists

The results for the repeated measures three-phase questionnaire are displayed (Table 2). The response rate for this questionnaire was 85% (12 of 14 completed).

Each time the questionnaire was administered the pharmacists agreed that they had a good understanding of Indigenous health issues (median [interquartile range; IQR]: 2.5[2-4], 3.0[2-4], 2.0[2-3], respectively) and cardiovascular medicines (median [IQR]: 2.0[2-3], 2.0[2-2.3], 2.0[1-2], respectively). Additionally, they strongly agreed or agreed throughout that they were keen to assist their local AHWs in a community forum (median [IQR]: 1.0[1-2], 2.0[1-2], 2.0[2-2], respectively). There were no statistically significant changes in these responses as a consequence of the pharmacist training or the delivery of the program to the AHWs (Table 2).

Initial administration of the questionnaire revealed the pharmacists did not agree that they were equipped to deal with Indigenous health issues or that they felt they had the necessary resources to train their local AHWs (median [IQR]: 4.0[3-4] for both statements). By the end of the program responses indicated that the pharmacists now agreed with both these statements (median [IQR]: 2.0[2-3] and 2.0[2-2], respectively). A statistically significant difference in medians was evident from the administration of the questionnaire from 'middle' to 'after', indicating the experience of delivering the AHW training resulted in the pharmacists agreeing with these statements ($p = 0.002$ and $p = 0.005$, respectively [Mann-Whitney *U*-test]).

Questionnaire administration, before and after the pharmacist education, revealed that the median score concerning the statement: 'I know the AHWs in my area' did not change (median [IQR]: 2.5[2-4]). However, after the delivery of the AHW education, the pharmacists agreed more strongly that they knew the AHWs in their area (median [IQR]: 2.0[1-2]) and this was a statistically significant improvement ($p = 0.005$ [Mann-Whitney *U*-test]).

Finally, throughout each administration of the questionnaire the pharmacists agreed that they felt confident to train their AHWs (median [IQR]: 2.5[2-3], 2.0[2-3], 2.0[1-2], respectively). However, a statistically significant difference in the pharmacists' responses revealed that they felt more confident to train their AHWs after the delivery of the AHW training program ($p = 0.007$ [Mann-Whitney *U*-test]).

Table 3: Demographics of the communities where the Aboriginal Health Worker education programs were held

Pharmacy Access/Remoteness Index of Australia (PhARIA) rating of pharmacy[27]	Highly accessible	3
	Accessible	3
	Moderately accessible	3
Indigenous population in the area[†28-36]	<2.5%	0
	2.5–10%	2
	>10%	7

[†]The average Australia-wide Indigenous population is 2.4%[28-36].

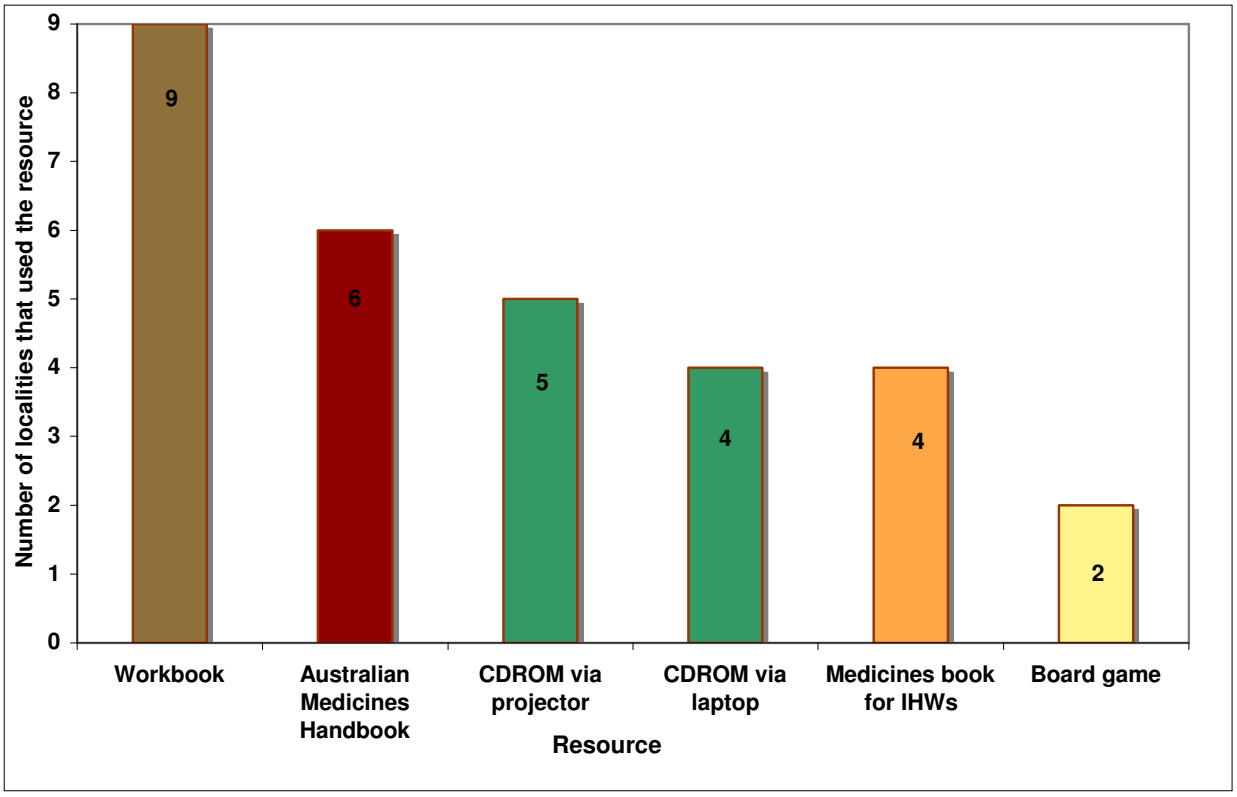

Figure 3: Resource use within Aboriginal Health Worker education program.

Semi-structured, face-to-face, in-depth interviews with pharmacists

Despite having a limited sample size, saturation of themes was obtained[42].

What was the impact of the program on the pharmacists? All pharmacists believed the pharmacist education weekend was a positive experience. They valued getting to know other pharmacists in the area and the majority found the information helped to improve their understanding of their local Indigenous communities.

> *The cultural awareness training got me to thinking more from the point of view of how the Indigenous* [people] *would be thinking …I have always had a wonderful interest, but it didn't go very deep* [and] *the fact that we had this bit of cultural awareness*

> *training on the weekend really showed me how different the way they* [Indigenous people] *operate is and how they work as families and that sort of thing.* (Respondent 9)

Despite this positive response, eight pharmacists reported that prior to delivering the AHW education program they felt unsure of the educational levels of the AHWs and were worried due to having no prior experience.

The delivery of the educational sessions to their AHWs further improved the pharmacists' awareness of local Indigenous health issues and their confidence in their ability to educate the AHWs. It also served to motivate the pharmacists to develop sustainable, effective relationships with their AHWs. This development of relationships was the aspect that 10 pharmacists enjoyed the most about the program.

> *I'll definitely continue to have a strong involvement now that I have a relationship with them.* (Respondent 1)

Was the program useful and acceptable to the AHWs? All the pharmacists reported that their AHWs thought the program was worthwhile, interesting and relevant. Across the board, pragmatic information was highly valued by the AHWs, according to the pharmacists.

> *If you can relate it to their actual job I think that was what they got more benefit from.* (Respondent 7)

The information that was widely valued included: brand versus generic drug names; drug side-effects and interactions; and explanations about the components of medicine labels, written prescriptions and repeat forms.

With regard to effective learning styles, practical application of the educational material was consistently reported to be more beneficial to the AHWs than a didactic 'lecturing' approach.

> *They said, can we have everything in posters relating to the body, like pictures and medication and a picture of the body showing which organ it is mostly working – cause its easy to remember.* (Respondent 12)

However, six pharmacists were unsure of how well the program equipped their AHWs to pass the knowledge on to their clientele.

> *I think that they all have a better understanding of cardiovascular medicines and physiology but I don't think they would be confident to go through that for someone.* (Respondent 12)

What were the barriers and facilitators? Organisation of the AHW education units was the greatest barrier to the project, with five pharmacists specifically reporting they felt distressed and de-motivated as a result of this component of the project. Miscommunications during the organizational process resulted in four pharmacists arriving to the first session to find that, despite prior organization via telephone contact, the AHWs reported no knowledge that the session was to take place. Problems in agreeing on a common time to hold the education sessions were contributed to by the pharmacists experiencing difficulties in leaving the pharmacy (due to difficulties in arranging replacement pharmacists) and the AHWs experiencing work priorities competing with session attendance. Additionally, disagreement between Indigenous family/social groups within the communities resulted in organizational difficulties and lower numbers of AHWs attending the sessions. One pharmacist dealt with this issue by running duplicate sessions for the opposing family groups, while all others simply chose one group to teach.

An important organizational facilitator was a prior established relationship with Indigenous health services. The experience of two pharmacists with existing infrastructure, including pharmacist services of the S100 Medicines Scheme[16] or arrangements through the National Prescribing

Service Limited, provided a greater understanding of program-relevant issues within their community. A relationship with key contacts within Indigenous health services and an ability to utilise an existing rapport between the pharmacist and Indigenous health service also helped the process. Furthermore, the post-program response from pharmacists who had no previous relationships with the Indigenous health services indicated that now they had formed this relationship, fewer organizational barriers were anticipated in future programs.

Other organizational facilitators included identifying and liaising in person with key people of authority within the health services prior to initiating the organizational process; using group-email; and enlisting the support of a third party, such as the university.

In addition to organisational issues, 10 pharmacists reported that the sessions took longer than expected and they needed to omit certain segments of the content. The information omitted was consistently reported to include information about drug pharmacokinetics and the physiology of the diseases. Specific comment was also made by a number of pharmacists that the use of potentially complex terms in the educational material should be simplified.

What were the suggested strategies for the future? The relationships developed between the pharmacists and the AHWs were a key contributor to all suggested future strategies. A common suggestion included the pharmacist acting as a source of advice for the AHWs.

> *Now that we know each other, they can ring me if they have any questions.* (Respondent 1)

And alternatively:

> *Since I've done the program I do tend to ring Aboriginal health and say: 'So and so hasn't picked up their tablets do you mind popping in and seeing* [him/her]*?'. Yeah so that's been a plus* [and] *they are happy to do that.* (Respondent 11)

Some pharmacists foresaw that building this relationship would require a proactive, persistent approach by the pharmacist to ensure its longevity beyond the program:

There was unanimous agreement that an approach to strengthening this relationship was to continue the pharmacist-led AHW education program. However, there was no agreement regarding the optimal frequency of this approach. In addition, the majority of pharmacists were unwilling to assume full responsibility for future program implementation and delivery, citing that a third party was required. Many pharmacists reported that using existing infrastructure or developing incentives for professional continuing education points or developing an ongoing partnership with the university could enable the continuation.

Five pharmacists suggested that multidisciplinary attendance at future educational sessions would assist to develop inter-professional networks within the communities and bolster attendance numbers at the sessions.

> *So lets have the diabetes educators and all the AHWs and the dieticians and the pharmacists and you know, the GPs...I don't think they* [the AHWs] *necessarily need to be singled out but I feel they need to be coaxed along…* (Respondent 12)

Feedback from Aboriginal Health Workers

Survey feedback: Thirty-two of a potential 47 feedback surveys were completed by the AHWs (a response rate of 68%). The program appeared to be overwhelmingly acceptable to the AHWs with respect to each statement within the survey (Table 4).

Table 4: Aboriginal Health Worker survey (with responses)

Survey statement	Strongly agree or Agree (%)
1. The information was helpful to my role as an Aboriginal Health Worker.	31/32 (96)
2. I found the information clear and easy to understand.	32/32 (100)
3. I felt I learnt a lot about cardiovascular medicines.	32/32 (100)
4. The presenter listened to what we had to say.	31/32 (96)
5. The presenter was interested in their topic and encouraged me to get involved.	31/31 (100)
6. I would be interested in working with the pharmacist on other areas of medication management that are important to my community.	24/25 (95) *Earlier survey did not include this question*
Written open-ended questions: • Please highlight if there were any other areas of medication that you would like more information. • Any extra comments?	

The AHWS used the written open-ended questions to request further information regarding: diabetes medications, smoking cessation, mental health, asthma and chronic obstructive pulmonary disease medications. The vast majority also reported positively on the quality of the information presented and the relevance of the information to their role as an AHW. A typical response with regard to the quality of the information was:

> *Overall very worthwhile, I really enjoyed it.*

And with regard to the relevance of the information:

> *More of these sessions would be of great value to my work in the community.*

Attendance at units: Of the 47 AHWs who participated in the program, the majority (57%, *n* = 27) completed all four units, although this was only 46% of the total AHWs who could have participated in the program. Nineteen per cent (*n* = 9) completed three units; 13% (*n* = 6) completed two units; and 11% (*n* = 5) completed only one unit. The attendance at each of the four units was 78% (*n* = 37), 84% (*n* = 40), 89% (*n* = 42) and 84% (*n* = 40), for units one to four, respectively, indicating minimal drop-off for any particular topic/unit.

Discussion

This evaluation demonstrated that the pharmacist-led medicines education program had a positive impact on the pharmacists and AHWs in terms of relationship development, confidence to educate AHWs (for the pharmacists) and improved access to medicines-based education resources (for the AHWs). Forty-seven of a possible 59 AHWs (80%)[41] attended one or more medicines training sessions, which is larger than other previous studies involving education programs for AHWs[19-20,43-44]. The research tools revealed consistencies between the AHWs and pharmacists' responses (discussed below) and agreement between qualitative and quantitative assessment tools, providing some confidence in the methodology of this study.

Was the program acceptable and useful to the Aboriginal Health Workers?

The AHWs found the program highly acceptable. This opinion resonated throughout the AHW feedback survey and written responses, pharmacist interviews and the high attendance at educational sessions. Similar very positive responses from AHWs for educational programs have been reported in other literature[43,44] and may simply be due to gratuitous concurrence (in which a positive response is given regardless of true opinion). However, the use of different research techniques in the current study provides some

additional confidence in these findings. This is important because gratuitous concurrence is a common miscommunication between Indigenous and non-Indigenous Australians[12].

A highly valued aspect of the program to the AHWs was the delivery of pragmatic, personally relevant information about medicines. This finding provides direction for future medicines-based education programs for AHWs. It is also supported by other literature in which Indigenous educational programs have promoted the use of education relevant to local community requirements[22,43]. Nonetheless, for future material development, it is important to acknowledge the diverse roles among AHWs[1,17,21] and, hence, to be useful to a broad range of AHWs, future programs will benefit from being flexible, participant directed and able to cater for a broad range of knowledge requirements about medicines[23,45].

There was no formal evaluation of knowledge acquisition within the program because it was felt that this may deter AHWs from attending. Instead a pre- and post-self-test was provided for each module and given to the AHWs to take home as part of the educational materials. Nevertheless some of the pharmacists remained dubious that the program had instilled sufficient confidence in the AHWs to allow them to successfully relay the information to their clientele. While the use of a didactic examination format is likely to prove ineffective in gaining real insight into the amount of knowledge imparted to the AHWs[22], a potential solution to ensure 'the message is passed on' may lie in further collaboration between the participants of the study. Both the AHWs and the pharmacists indicated that they would be enthusiastic about participating in a forum involving both the pharmacist and the AHW, educating an Indigenous clientele about cardiovascular medicines. This type of partnership approach has not been evaluated in the literature but it may be a worthwhile strategy to assist the AHWs in the confident application of their knowledge of cardiovascular medicines. This concept also supports literature recommendations in that it promotes sustainable partnerships within the educational setting and is an avenue for extended support for Indigenous learners[23,45].

What was the impact on the pharmacist?

The facilitation of relationships between the AHWs and pharmacists was the most highly valued aspect of the program. Development of inter-professional relationships within rural communities has been shown to have a substantial impact on overcoming social and professional isolation and increasing retention of the rural pharmacist workforce[46].

The 'active' experience of delivering the education to the AHWs had a more substantial impact on the pharmacists than their participation in the pharmacist education weekend. This finding is reflected in the literature. The delivery of education by non-Indigenous educators involving a two-way cultural exchange (as opposed to passively receiving education) is considered to be an important contributor to the ultimate success of education programs in an AHW context[21].

The pharmacists appeared to cope well as educators of AHWs. This is evidenced in the questionnaire and interview responses by their improved confidence to deal with Indigenous health issues and train their local AHWs. The literature suggests that improved self-efficacy of teachers can positively impact on the motivations of students, ultimately leading to better quality education[47]. This finding also supports the concept of expanding the role of community pharmacists towards more educational pursuits[26,48] and has informed this conceptual framework to show that these pharmacists coped well as educators in a cross-cultural context.

What were the barriers and facilitators?

The organization of the AHW education program was the component that most pharmacists liked least about their involvement in the project. The qualitative interviews revealed that the pharmacists who experienced the least

organizational difficulties were those who had prior established relationships with their local Indigenous health organizations. Other key organizational facilitators appeared to be liaising with people in key positions of authority within the Indigenous organizations and visiting in person. The literature suggests that contacting people in key positions of authority within the Indigenous education environment can have a 'multiplier effect'[21] in that the program implementation occurs more 'smoothly'[16] and education is more effectively passed on to other members of the Indigenous community[21].

The attendance of AHWs was not 100% and there may be many reasons for this. Some AHWs were clearly 'stretched' by multiple demands and unable to find time in their busy schedules. In addition, some were not always in the same town. This made finding a suitable time when all could attend almost impossible and demonstrates one of the difficulties of working with staff who have a high workload and a wide geographical area to cover due to the scattered population.

What were the suggested strategies for the future?

There was definite approval for a future role of the pharmacist as educators of AHWs. To be sustainable in this role, participating pharmacists suggested they needed support to provide ongoing content development, program organization and program funding; and the integration of the program into professional continuing education programs for pharmacists. However, this study has shown that local control and relationship development are as important to program success as effective content and organizational strategies. Community ownership and input from AHWs, their associated Indigenous health organizations and members of the local Indigenous community is crucial to ensuring that future programs remain relevant[19,22,49].

Limitations of this study

Several factors limit the interpretation of the findings in this study. Firstly, the imbalance of input between the AHWs and the pharmacists functioned to bias the study towards the pharmacists' perceptions. Future studies should consider gaining a deeper insight from the AHWs' perspective by exploring needs and issues identified by AHWs themselves and by employing a post-training evaluation of the longer-term usefulness of the program for the AHWs. Also, due to a lack of validated analysis tools in this area, the contents of the questionnaire and survey were developed empirically.

An obvious and important aspect not evaluated in this study was the real effectiveness of the program in contributing to the improvement of health outcomes. Unfortunately this was beyond the scope of the project both in the time and funding. Finally, no investigation of the pharmacists who were not interested in participating in the study was performed.

Conclusions

The results of this study provide an increased understanding of future requirements for improving the knowledge of AHWs in cardiovascular medicines management and the ability of local community pharmacists to deliver such education. The development of local, supportive and ongoing relationships had a key influence on the perceived worth of the program to the pharmacists and the AHWs. It is anticipated that this type of program will contribute to the development of productive and sustainable relationships between AHWs and their local community pharmacists, to positively influence the health of local Indigenous people.

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References

1. National Aboriginal Community Controlled Health Organizations and Oxfam Australia. *Close the gap: solutions to the Indigenous health crisis facing Australia*. Fitzroy, VIC: Oxfam Australia, 2007.

2. Couzos S, Thiele D. The International Covenant on Economic, Social and Cultural Rights and the Right to Health: is Australia meeting its obligations to Aboriginal peoples? *Medical Journal of Australia* 2007; **186:** 522-524.

3. Pincock S. Australia lags behind in attempts to improve the health of Indigenous people. *BMJ* 2007; **334:** 765.

4. Pink B, Allbon P for Australian Bureau of Statistics and Australian Institute of Health and Welfare. *The health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2008.* ABS catalogue no. 4704.0; AIHW catalogue no. IHW 21. Canberra, ACT: Commonwealth of Australia, 2008.

5. Emerson L, Bell K, Croucher K. *Quality use of Medicines in Aboriginal Communities Project. Final Report*. Canberra, ACT: Pharmacy Guild of Australia, 2001.

6. Hamrosi K, Taylor S, Aslani P. Issues with Prescribed Medications in Aboriginal Communities: Aboriginal Health Workers' perspectives. *Rural and Remote Health* **6:** 557. (Online) 2006. Available: www.rrh.org.au (Accessed 10 December 2008).

7. Murray R. Prescribing issues for Aboriginal people. *Australian Prescriber* 2003; **26:** 106-109.

8. Australian Institute of Health and Welfare. *National health data dictionary*. Canberra, ACT: Australian Institute of Health and Welfare, 2003.

9. Australian Bureau of Statistics. *2001 Census of Population and Housing Australia: Indigenous Profile*, report no 2002.0. Canberra, ACT: ABS, 2001.

10. Urbis Keys Young. *Aboriginal and Torres Strait Islander access to major health programs*. Sydney, NSW: Urbis Keys Young, 2006.

11. Hoy WE, Wang Z, Baker PR, Kelly AM. Secondary prevention of renal and cardiovascular disease: results of a renal and cardiovascular treatment program in an Australian Aboriginal community. *Journal of the American Society of Nephrology* 2003; **14(7 Suppl2):** S178-185.

12. Australian Government Department of Health and Ageing. *National Medicines Policy 2000*. Canberra, ACT: AusInfo, 2000.

13. Cass A, Lowell A, Christie M, Snelling P, Flack M, Marrnganyin B. Sharing the true stories: improving communication between Aboriginal patients and healthcare workers. *Medical Journal of Australia* 2002; **176:** 466-470.

14. Shannon C, Carson A, Atkinson R. Perspectives on Aboriginal community controlled health services: the manager. *Medical Journal of Australia* 2006; **184:** 530-531.

15. Kelaher M, Taylor-Thompson D, Harrison N, O'Donoghue L, Dunt D, Barnes T. *Evaluation of PBS Medicine supply arrangements for remote area Aboriginal health services under S100 of the National Health Act*. Melbourne, VIC: Co-operative Research Centre for Aboriginal Health and Program Evaluation Unit, University of Melbourne, 2004.

16. Keys Young Market Research. *Keys Young market research into Aboriginal and Torres Strait Islander access to Medicare and The Pharmaceutical Benefits Scheme*. Canberra, ACT: Keys Young, 1997.

17. The Australian Bureau of Statistics and the Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*. Canberra, ACT: ABS, 2005.

18. Mitchell M, Hussey L. Training and workforce: the Aboriginal health worker. *Medical Journal of Australia* 2006; **184:** 529-530.

19. Community Services & Health Industry Skills Council. *Health Training Package HTL07*. (Online) 2007. Available: http://www.cshisc.com.au (Accessed 5 August 2007).

20. Loller H. *Report from surveys conducted in Commonwealth funded Aboriginal Health Services and Pharmacies supplying services under Section 100 Pharmacy Allowance, Section 100 Support Project, Pharmacy Guild of Australia and National Aboriginal Community Controlled Health Organization*. Canberra, ACT: Pharmacy Guild of Australia, 2003.

21. Australian Government Department of Health And Ageing. Canberra: *Aboriginal and Torres Strait Islander Health workforce: Aboriginal and Torres Strait Islander health worker information*. (Online) 2007. Available: http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-oatsih-workforce-s2.1 (Accessed 23 April 2007).

22. Cousins C. The will to learn, not just teach: challenges and considerations for educators of Aboriginal adults. *Australian Journal of Adult Learning* 2003; **43:** 101-114

23. Miller C. *Aspects of training that meet Indigenous Australians' aspirations: a systematic review of research, National Centre for Vocational Educational Research (NCVER)*. Adelaide, SA: NCVER, 2005.

24. Saini B, Krass I, Armour C. Development, implementation and evaluation of a community pharmacy-based asthma care model. *Annals of Pharmacotherapy* 2004; **38:** 1954-1960.

25. Stuurman-Bieze A, de Boer W, Kokenberg M, Hugtenburg J, de Jong-van den Berg L, Tromp T. Complex pharmaceutical care intervention in pulmonary care. Part B: Patient opinion and process survey. *Pharmacy World & Science* 2005; **27:** 385-392.

26. Stoneman J, Taylor SJ. Pharmacists' views on Indigenous health: is there more that can be done? *Rural and Remote Health* **7:** 743. (Online) 2007; Available: www.rrh.org.au (Accessed 10 December 2008).

27. Australian Government Department of Health and Ageing. *Pharmacy Access Remoteness Index of Australia (PhARIA)*. (Online) 2002. Available: http://www.spatialonline.com.au/gisca02/pharmpub/viewer.htm (Accessed 5 October 2007).

28. Australian Bureau of Statistics. *2006 Census Quick Stats: Gilgandra (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

29. Australian Bureau of Statistics. *2006 Census Quick Stats: Dubbo (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

30. Australian Bureau of Statistics. *2006 Census Quick Stats: Bathurst (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

31. Australian Bureau of Statistics. *2006 Census Quick Stats: Warren (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

32. Australian Bureau of Statistics. *2006 Census Quick Stats: Peak Hill (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

33. Australian Bureau of Statistics. *2006 Census Quick Stats: Condobolin (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

34. Australian Bureau of Statistics. *2006 Census Quick Stats: Dareton (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

35. Australian Bureau of Statistics. *2006 Census Quick Stats: Broken Hill (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

36. Australian Bureau of Statistics. *2006 Census Quick Stats: Bourke (Urban Centre/Locality)*. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

37. Swain L, Taylor S. Pharmacy student education helping to improve Indigenous medication management and health. *Australian Pharmacist* 2006; **6:** 490-494.

38. Mays N, Pope C. Qualitative research in health care: assessing quality in qualitative research. *BMJ* 2000; **320:** 50-52.

39. Pope C, Ziebland S, Mays N. Analysing qualitative data. *BMJ* 2000; **320:** 114-116.

40. Howell D. *Fundamental statistics for the behavioural sciences*, 3rd edn. Belmont, CA: Duxbury Press, 1995.

41. Australian Bureau of Statistics. *2006 Census tables: occupation by sex: health occupations (Statistical divisions)*, category no. 2068.0. (Online) 2007. Available: http://www.censusdata.abs.gov.au (Accessed 1 August 2007).

42. Mays N, Pope C. Qualitative research: rigour and qualitative research. *BMJ* 1995; **311:** 109-112.

43. Pacza T, Steele L, Tennant M. Development of oral health training for rural and remote Aboriginal health workers. *Australian Journal of Rural Health* 2001; **9:** 105-110.

44. Vindigini D, Parkinson L, Blunden S, Perkins J, Rivett D, Walker B. Aboriginal health in Aboriginal hands: development, delivery and evaluation of a training programme for Aboriginal Health Workers to promote the musculoskeletal health of Indigenous people living in a rural community. *Rural and Remote Health* **4:** 281. (Online) 2004; Available: www.rrh.org.au (Accessed 10 December 2008).

45. Adams K, Spratling M. Keepin ya mob healthy: Aboriginal community participation and Aboriginal Health Worker training in Victoria. *Australian Journal of Primary Health* 2001; **7:** 116-119.

46. Harding A, Whitehead P, Aslani P, Chen T. Factors affecting the recruitment and retention of pharmacists to practice sites in rural and remote areas of New South Wales: a qualitative study. *Australian Journal of Rural Health* 2006; **14:** 214-218

47. Nugent K, Bradshaw M, Noriko K. Teacher self-efficacy in new nurse educators. *Journal of Professional Nursing* 1999; **15:** 229-237.

48. Krass I, Armour C. Diabetes care in community pharmacy – what do patients and pharmacists think? *Australian Journal of Pharmacy* 2003; **84:** 542-545.

49. Rose M, Pulver L. Aboriginal Health Workers: professional qualifications to match their health promotion roles. *Health Promotion Journal of Australia* 2003; **15:** 240-244.

