

Didgeridoos, songs and boomerangs for asthma management

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Introduction

Asthma is estimated to affect 10% of the Australian population; a high figure by international standards.¹ Asthma adversely affects quality of life^{2,3} and people with current asthma rate their health lower than people without.⁴ In 2004/05, asthma expenditure was \$606 million or 1.2% of the total allocated national health expenditure in that year.¹

Compared to non-Indigenous Australians, Aboriginal and Torres Strait Islander Australians have higher prevalence of asthma and higher associated rates of hospitalisation and mortality with the disease.¹

One non-pharmaceutical approach to asthma management that has been advocated is breathing exercises, singing and playing of wind instruments.⁵⁻⁷ Elsdon wrote more than 100 years ago that singing is "a great adjunct to health" resulting in "the diaphragm and other important muscles are brought into action, the throat is strengthened, and every part of the torso is benefited".⁸ More recently the attributes of singing

on both mental and physical health have been reported^{9,10} and used in the aged community.¹¹

Part of the benefit of singing and playing of wind instruments is attributed to improvements in respiratory function, which has prompted studies using singing to support Chronic Obstructive Pulmonary Disorders.^{12,13} Studies of breathing retraining in the treatment of patients with asthma were the subject of a Cochrane review in which the authors noted that the trend for improvement, notably in quality of life, was encouraging.¹⁴

Playing of wind instruments has also been reported to support asthmatics resulting in fewer symptoms, an improved sense of well-being and fewer emotional swings.¹⁵ The Bronchial Boogie project is reported to improve the asthma of 7-11 year olds in the UK,¹⁶ and an Asthma Initiative Program in New York complements medical treatment with music therapy to enhance the breathing capacity and quality of life of children and teens with asthma.¹⁷

Abstract

Issue addressed: In Australia, asthma is more prevalent among Indigenous than non-Indigenous people. Awareness of asthma and compliance with management plans are poor, as is engagement with health services in general. The study explored whether offering culturally appropriate music lessons could enhance asthma awareness and engagement to improve asthma and general wellbeing.

Methods: Two studies undertaken in 2007 and 2009 offered music lessons to Indigenous asthmatics in a junior school and a senior school, an Aboriginal Medical Service and a community centre. Males were taught the didgeridoo and females singing and clap sticks. Associated activities of painting and boomerang throwing were offered. At regular intervals participants were assessed for their asthma status. At completion participants reported on the benefits of the study.

Results: Excellent retention occurred in Study 1 for adolescents and junior males but was poor for junior females and adults. Contributory factors to retention were parental and school support for minors and other health factors for adults. Respiratory function improved in males and both males and females reported increased wellbeing. In Study 2 retention of all participants was excellent. In addition there was increased engagement of both participants and their families with medical services. In both studies awareness of asthma and compliance with asthma management plans increased. Social skills improved as did cultural awareness.

Conclusion: The offering of music lessons is a culturally appropriate and enjoyable intervention to promote asthma, general health awareness and engagement with medical services.

Key words: asthma, Indigenous, music, health and wellbeing, didgeridoo, Australia.

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So What

Providing culturally appropriate interventions is an effective mechanism to engage Indigenous people with medical services.

The program reported herein was developed to support Indigenous asthmatics and was guided by the literature noted here. Its ongoing aim is to contribute to the health of asthmatics within the local Indigenous community. The key objectives to date have been to determine whether the intervention of music therapy would engage the community. Supplementary objectives were to increase the participants' knowledge of asthma, expose participants to their traditional culture and to increase engagement of participants with health services.

Intervention programs with Indigenous Australian communities have fallen short of their intended goals and a lack of culturally appropriate delivery may be one contributory factor.¹⁸ It is generally accepted that engagement of Indigenous communities in health matters are more successful if the information is disseminated by Indigenous Health Workers. In recognition of the above, partnerships were established with Aboriginal Medical Services (AMS) in the study areas of Toowoomba and Dalby on the Darling Downs in Southern Queensland.

Methods

Consultations gathered information to enable the research team to meet both the aims of the program and the cultural needs of the participants. For Study 1, a community meeting was organised with Community Elders. Study 2, which was undertaken in the much smaller community of Dalby utilised consultation with the AMS staff, the majority of whom are members of the town's Aboriginal community.

Participation was targeted at people who identified as being Aboriginal or Torres Strait Islander. Community awareness of the projects was raised through the local newspapers, radio and television and notices placed in the AMS clinics and in schools. For both studies AMS patients with asthma were contacted, encouraged to participate and also to spread the word in the community. In addition, for Study 1 letters were sent to the parents/guardians of Indigenous students in two schools. These recruitment strategies ensured that information reached the majority of the local Indigenous populations.

Potential participants were screened for eligibility, i.e. diagnosis of chronic asthma, which was based on a combination of factors including an asthma assessment questionnaire, medical history, previous diagnosis, current medication use and spirometry.

Each male was given a didgeridoo made by local Aboriginal craftsmen. Didgeridoo teachers in both studies were local Aboriginal musicians who taught traditional didgeridoo sounds and melodies including the art of circular breathing. Females on Study 1 were taught at the same time but in another room to the males. The females had singing lessons and breathing exercises taught by a professional non-Indigenous singer

accompanied by an Aboriginal singer. In Study 2 females and males were taught at the same time by the same Aboriginal person. Additional activities employed were story telling, playing of clap sticks, painting and boomerang throwing. In attendance at all the classes was at least one AMS asthma project officer and during Study 2 parents/guardians were sometimes present.

All lessons on Study 1 were weekly for one hour over a 26 week period. At the junior school lessons were during lunch break and at the senior school during midday assembly. The adults' lessons were held at the AMS in the morning. Food and transport were provided. For Study 2 all participants were taught together in a community centre for 90 minutes on Tuesdays and Thursdays from 3.30 pm to 5.00 pm over 17 weeks. Transport was provided to the centre as needed and healthy snacks were offered. In addition to lessons participants were encouraged to practise their music at home.

Participants received culturally appropriate written material about asthma. The AMS staff also provided information and advice about asthma and its management.

During the studies spirometry was performed three times and participants were given peak flow metres to determine their twice daily peak expiratory flows. Values plus additional information, e.g. coughing, wheezing and medication use were recorded in a diary. It was recognised after the Study 1 that compliance with both the taking and recording of peak flow was highly variable and data was of limited value; however the activity helped awareness and for that reason was retained for Study 2.

At the end of the interventions participants and parents (for Study 2 only) were invited to submit anonymous comments about the program.

Data analysis

Respiratory data were compared at different time intervals with paired t tests using SPSS Version 15 for Windows (SPSS Inc. 2007).

Ethics

Ethics approval was received from the University of Southern Queensland Human Research Ethics Committee. Written consent was received from all adults and from the legal guardians of minors.

Results

Recruitment and retention of participants varied across the studies and within the Study 1 groups (Table 1). Between enrolment of eligible participants and the first lessons a combined total of 12 (18.5%) were lost mostly because of work commitments of adults (n=10). During the course of

classes there were 15 (28%) participants who left the study. However, five of these participants moved from the towns and their removal from the data raises retention to 79% (males=91%; females=68%).

Table 1: Recruitment and retention.

	Age range	Enrolled	First lesson	Retained	Per cent
Study 1					
Adult females	39-77	7	4	3	75
Adult males	41-55	3	1	1	100
Junior females	6-10	5	5	0	0
Junior males	7-10	4	4	4	100
Senior females	13-17	13	13	9	70
Senior males	14-17	8	6	5	83
Sub total		40	33	22	66
Study 2					
Males	6-59	16	14	11	79
Females	7-35	9	6	5	83
Sub total		25	20	16	80
Grand total		65	53	38	72
Adjusted ^a			48	38	79

Note: a) Five participants left school and/or district.

The views of the participants to the programs are given in Table 2 demonstrating enjoyment, awareness and perceived benefits to health. No-one indicated a lack of enjoyment or deterioration of health. One participant summed up his feeling

"I'm glad I have asthma because I can come here".

Forced expiratory volume in one second (FEV1) and forced expiratory vital capacity (FVC) values, as standard measures of respiratory function, both increased between the first and third tests ($p < 0.01$) in the senior school boys. These boys also reported a noticeable improvement in their health. Similar but non-statistically significant improvement was seen in the high school girls, however, like the boys they too perceived an improvement in their asthma symptoms.

No changes were detected by spirometry in the shorter Study 2. Quantitative determination of improvement of younger participants was difficult. For many their cognitive and/or physical ability prevented them from effectively using the

Table 2: Comments from participants.

Enjoyment	Education/Awareness	Health
<i>I enjoyed it heaps and if I could I would do it again.</i>	<i>It brought awareness of asthma.</i>	<i>I found it rewarding and beneficial to my health.</i>
<i>Well I have really loved the group. It was really fun.</i>	<i>For those who are teaching people about asthma I hope this has helped them too.</i>	<i>It really helped my breathing.</i>
<i>I liked the singing and some of the breathing things; it was awesome.</i>	<i>People who are teaching asthmatics are able to educate asthmatics in the community to help individualise their condition.</i>	<i>The didgeridoo increased my respiratory capacity and control; I could inhale bigger breaths and then exhale out through the didgeridoo for longer; the sound of the instrument was an incentive to exhale longer.</i>
<i>I really enjoyed the asthma program.</i>	<i>I have learned a lot about asthma and medications and when to use them.</i>	<i>This program has helped me with my breathing during nights.</i>
<i>I really enjoyed being in the asthma music program. My two children also attended and had a lot of fun along the way.</i>	<i>I have better awareness of using preventative medicine, regular breathing, discussion of asthma and learn what stimulates asthma.</i>	<i>Before [the lessons] 1km was a massive run but when I went on camp I ran 6km non-stop on the beach so SUCCESS.</i>
<i>I loved it. To be able to sign up and have fun during school is pretty awesome.</i>	<i>The asthma action plan has been very helpful and clear cut. This has enabled the medications to be tailored to my needs.</i>	<i>The medical program has helped me with my asthma because I can now run more than 100 metres before I feel like coughing.</i>
<i>I would love to do it again if the opportunity arise.</i>	<i>This programme has helped me understand asthma better.</i>	<i>The program has helped me a lot in regards to asthma.</i>
<i>I liked the didge playing and practicing.</i>	<i>Regular use of the peak flow meter was an eye opener for me; I am now much more aware of the difference my medication has on my breathing.</i>	<i>It helped me a lot with my breathing and it was fun as well.</i>
<i>I have enjoyed the didge playing; It was fun</i>	<i>I have learnt about the asthma action plans.</i>	<i>It helped me with my asthma.</i>
<i>I feel good that I have participated in this program.</i>	<i>Help asthmatics be aware of their triggers; Also be aware that exercise should be part of their life and will help their health.</i>	<i>I think that the programme must have helped as I haven't been sick yet and I would normally have been sick by now.</i>
<i>I really enjoyed being here with the kind and lovely teachers they are cool.</i>	<i>I have learnt more about asthma and have my own asthma action plan.</i>	<i>I don't know how much it helped their lung function but they haven't been sick yet.</i>
<i>I liked throwing boomerangs, eating food and playing the didge.</i>	<i>This program has helped us understand asthma better.</i>	<i>Usually we have been sick by now but we haven't this year.</i>
<i>I would definitely partake in another project with the same amount of enthusiasm.</i>	<i>It helped me to understand how my asthma works and how I can manage my asthma.</i>	<i>The program really helped me with my asthma.</i>
<i>I liked the food, the juice and playing outside</i>	<i>I didn't know so many people had asthma.</i>	
<i>I just like it! I really like doing the peak flow and getting a high score.</i>	<i>During the project I met other people with asthma just like me.</i>	

spirometer. At the beginning some of the children were unable to follow the directions and others unable to coordinate their exhaling into the apparatus. However by the end of the study time and practice allowed the spirometry readings to be collected from all.

Despite a lack of data on respiratory function most participants indicated that their health had improved and attributed that improvement to the program. Numerous other benefits were also reported. Benefits directly related to asthma and asthma management were increased knowledge and awareness by the participants of their asthma; the development of individual asthma plans; and greater compliance with the taking of medication.

Additional health benefits were realised that not only affected participants but parents as well. These were removal of barriers to the access to medical services; opportunistic health education and promotion activities; new medical appointments for asthma review and other health issues; and discussion between nurse and parents/carers about health issues

"Now that we know you we would be happy to come and see you. We don't like to take medicine but we would be happy to talk to you."

"I am very happy to come now that I know you as I wouldn't normally go to the doctors."

Other benefits from the program were improvements in social behaviour and awareness, cultural awareness and friendship.

"It got me out of the house and mixing with other people."
(Elderly female participant)

"I have observed a definite social benefit with the group; 'connectiveness' occurred." (Asthma nurse)

"Socially each of the clients came from different tribes and they enjoyed sharing their history with each other. I encouraged this, as it is important to them." (Music teacher)

"These boys at the start were disrespectful to their Indigenous heritage, however the more they were told about the cultural side of the didgeridoo (the laws, mythology and significance of the didgeridoo to us as Australians), the more they became intrigued and interested to learn as many aspects of their culture and heritage as they could, which in turn has increased their confidence level." (Music teacher)

Discussion

Wind instruments were advocated over 30 years ago in the management of asthma⁶ and are being effectively used in at least one other country.¹⁶ However, we could find only one published study⁷ and our work appears to be the first both in using the didgeridoo and involving Indigenous Australians.

The primary objective of these studies, which was to

determine engagement in Indigenous people, was achieved. Firstly, within a relatively controlled school environment, and then in the wider community where there was completely voluntary participation. After the initial loss of participants, retention on the project was excellent, demonstrating that the intervention is engaging and can be utilised to support the management of asthma in Indigenous people. Consequently the project was successful in determining if the program could be utilised to support the management of asthma in Indigenous communities. There is no reason that the intervention could not be transferred to other groups where recruitment will be supported by the testimonials of our participants.

There can be no question that participants enjoyed the programs and that enjoyment probably contributed to their greater feeling of well-being. The students clearly benefited from the program as demonstrated by their own assessments and those of their parents.

Acquisition of knowledge about asthma and an awareness of its symptoms and consequences were also an important part of the program. Many of the participants were poorly informed about their disease and education booklets and advice offered by the clinical staff was extremely beneficial. Their knowledge of asthma increased, asthma action plans were developed and there was greater compliance with medication.

Furthermore, we were successful in increasing cultural awareness and social skills, especially among the girls. These are extremely important to increasing the health and wellbeing of the community. For the participants, the psychological benefits of social and cultural awareness and the discovery of new activities and friends have great potential.

The success of the program can be attributed to a number of factors; namely enjoyment, support of schools and parents and the knowledge and skills of the teachers and health staff. Success of the project in an open community setting also benefitted from the multiple activities of music, painting and play which were fun and retained interest. Participants looked forward to the lessons and their retention in this voluntary program substantiates that.

Much of the success of the project can be attributed to the four music teachers all of whom were well liked by participants. The AMS nursing and asthma project staff brought a tremendous amount of experience and knowledge. These attributes combined with their enthusiasm and dedication provided environments that were conducive to retention of participants and supported *ad hoc* health awareness among them and their parents/guardians.

It is widely accepted that success of Indigenous health programs is improved by the presence of Indigenous health workers and from strong relationships between community members and service providers. In our studies we met

these criteria through community consultation, provision of adequate information and the strong presence of Indigenous teachers and health staff. The result was an atmosphere of inclusion and trust that undoubtedly contributed to the overall effectiveness of the interventions in meeting their aims.

We do note that to run a similar program, school and parent/guardian support is essential. In Study 1 the senior school administration were extremely supportive of the program. In contrast, the junior school administration, although extremely supportive during the establishment phase, offered little support to ensure that the students attended the classes.

It is unknown how much parental support the senior school students received. However, based on retention, we assume that at worst there was little opposition and at best positive support. Unfortunately support from the parents of juniors, especially junior girls, was poor as demonstrated by failure to complete their peak flow sheets and showing up to class without their lunches and singing books. More education of parents was provided for Study 2 and may have attributed to the excellent retention of similar aged children.

Both sexes reported an improvement in their health and in Study 1 there were significant improvements in respiratory function in the males.¹⁹ Other studies using breathing exercises for asthmatics have shown various degrees of success,^{5,20,21} including one using the Buteyko deep forced exhalation breathing technique that reported a trend for increase in quality of life without objective changes in airway calibre.²² It is also interesting to note that the didgeridoo has been used as a treatment in obstructive sleep apnoea.²³ To prove the efficacy of the didgeridoo on breathing function further research with matched controls and comparing wind and non-wind instruments is planned.

Wider and far reaching health benefits were also achieved including removal of barriers to accessing further medical services. Some participants and parents who previously had been reluctant to attend medical services became comfortable enough to discuss other health issues such as parenting, reproductive health and domestic violence. Not only were they able to receive advice but as a result of these exchanges referrals to appropriate medical and allied health staff were made. In the extended family and social environment enjoyed by the Indigenous communities the benefits of this new engagement will soon be disseminated widely and should encourage even further participation.

The music intervention is easily transferable to communities. Ideally done in conjunction with a local health service the program is low cost and effective. As we discovered there are talented artists and musicians within communities who are willing to share their knowledge and expertise. With the support of a knowledgeable person it is entirely feasible for

students to make their own didgeridoos. All the didgeridoos used in our studies were made from locally collected wood already hollowed out by termites. Acquiring knowledge on how to paint the didgeridoos was part of the cultural experience. Although it is often not acceptable for females to play the didgeridoo singing is an ideal alternative because of its low cost, cultural relevance and likelihood of someone in the community being able to teach.

Overall the project demonstrated that this type of intervention has great potential, not only for supporting asthma but to be an important tool in health awareness and engagement within health services by Indigenous peoples.

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