Musculoskeletal physiotherapy provided within a community health centre improves access

Meredith Perry *BPhty, MManipTh, PhD*
Centre for Health and Activity and Rehabilitation Research, School of Physiotherapy, University of Otago, New Zealand

Sarah Featherston *BPhty*
School of Physiotherapy, University of Otago, New Zealand

Tom McSherry *BPhty*
School of Physiotherapy, University of Otago, New Zealand

Georgia Milne *BPhty*
School of Physiotherapy, University of Otago, New Zealand

Tara Ruhen *BPhty*
School of Physiotherapy, University of Otago, New Zealand

Karen Wright *BSc (Hons) Physiotherapy*
Senior Physiotherapist, Department of Physiotherapy, Hutt Valley District Health Board, New Zealand

ABSTRACT

This study assessed whether the provision of a musculoskeletal physiotherapy service within a Community Health Centre situated in a high deprivation area would change access rates. Retrospective data were collected from the health records of all patients referred for outpatient musculoskeletal physiotherapy at the Health Centre and at the city's primary hospital. Age, sex, ethnicity, deprivation level at first consult, and overall appointment attendance rates from the Hospital service in 2009 were compared with data from 2010 to April 2012 for the two service sites. An increase in patients identifying themselves as Māori (>120%) and Pacific Island (>130%) attending their first physiotherapy consult was found. Difference in sex, age, ethnicity and deprivation level between patients attending the two sites was significant (p-value <0.001). Patients who attended their first consultation predominantly identified themselves as European (Hospital; 69-71% and Health Centre; 20-22%) and as Māori (Hospital; 13% and Health Centre; 32-34%) respectively. Over 80% of the Health Centre's attendees lived in a high deprivation area compared to less than 60% of patients attending the Hospital service. The placement of fully funded physiotherapy services within a high deprivation area improved access particularly for minority ethnic groups living in New Zealand.

Perry MAC, Featherston S, McSherry T, Milne G, Ruhen T, Wright K (2015) Musculoskeletal physiotherapy provided within a community health cenre improves access New Zealand Journal of Physiotherapy 43(1): 40-46. DOI: 10.15619/NZJP/43.2.03

Key words: Physiotherapy, Health care access, Primary health care, Musculoskeletal

INTRODUCTION

Disparities in access to health care result in poorer health outcomes for groups of individuals living within a population (Ajwani et al 2003). While the definition of access varies, it is a concept which considers an individual's ability to identify their own health needs and have those needs fulfilled by the ability to seek and use a service (Levesque et al 2013). Individuals from ethnic minority groups, older adults, and people with disabilities are less likely to access or find it harder to access health care (Barnes et al 2012, Braveman and Gruskin 2003, Brown et al 2000, Jansen et al 2008, Lasser et al 2006) because the service characteristics are not considered "affordable, approachable, appropriate, acceptable, or available" (Levesque et al 2013 p 5).

Individuals belonging to marginalised populations, that is those considered to be, and/or those who perceive themselves to be unimportant (Cambridge Dictionaries Online 2015), often present with higher rates of chronic diseases and health problems, and suffer high disease-specific mortality rates (Ajwani et al 2003, Brown et al 2000, Lasser et al 2006). From a New Zealand context it is evident that a reduced health status exists for people identifying themselves as being of Māori and Pacific Island ethnic origin compared to Europeans[1] and for those living in a geographical area determined to be high deprivation[2] (Ajwani et al 2003, Baxter 2002, Ministry of Health 2012, Westbrooke et al 2001). Ethnic disparities in the areas of accidents and unintentional injuries, cardiovascular disease, respiratory disease and lifestyle disease are of particular relevance to physiotherapy (Ratima et al 2006). For example, people identifying as Māori are 1.4 times more likely to have chronic pain and 1.3 times more likely to have arthritis, after adjusting for age and sex differences (Ministry of Health 2012). They also have twice the rate of injury related health loss from transport related incidents such as motor vehicle accidents (Ministry of Health and Accident Compensation Corporation 2013) and a higher workplace injury claim rate (190 per 1,000 full time equivalents compared to 130 for people identifying as European) (Cram 2007). These are the sorts of problems that would be routinely seen by musculoskeletal physiotherapists.

1 Statistics New Zealand 2013 Census data use the level 1 term of European ethnicity to group New Zealand Europeans, Europeans (Scandinavians, Western and Eastern Europeans), Americans, Canadians, South Africans when not classified elsewhere, Afrikaners, and Zimbabweans.

2 Deprivation in New Zealand is determined by eight sequentially weighted dimensions: communication, income (benefit or below an income threshold), employment status, qualifications, home ownership, level of support needed, living space, and access to transport (Atkinson et al 2014).

While data determining the access of musculoskeletal outpatient physiotherapy in New Zealand is limited, the Accident Compensation Corporation (ACC) injury claim rate for people identifying as Māori is significantly lower than for the general population. Therefore for accident related injuries at least, this group is unlikely to benefit from all possibly relevant health services (Cram 2007).

The Primary Health Care Strategy, implemented in February 2001 by the then government, aimed to reduce health inequalities and improve the health of New Zealanders (Ministry of Health 2011b). Its purpose was to create an overall framework for the organisation and delivery of primary health care (King 2001). This framework shifted primary health care from an independent practitioner centred model to an interdisciplinary and community governed model.

An important component of the Health Care Strategy was the establishment of Primary Health Organisations (PHOs). These community-governed non-profit organisations were intended to aid mitigation of significant financial, cultural and geographical barriers to accessing primary care to ensure adequate health care access for enrolled populations (Ministry of Health 2011a). Theoretically, those in greatest need of health care would have easier access to health care services (King 2001).

Ethnic proportions vary across New Zealand. In the city where this study was performed, the proportion of people identifying as Māori, Pacific Island, and Middle Eastern, Latin American, and African (MELAA) is above the national average in all three groups (Statistics New Zealand 2014). Furthermore, some areas within this city report proportions of over 26% and 21% for people identifying as Māori and Pacific Island respectively (Statistics New Zealand 2014). These same geographical areas are also categorised as areas of high deprivation (Atkinson et al 2014).

Due to anecdotal evidence of disparities in musculoskeletal physiotherapy outpatient access between specific ethnic groups in this city, the local District Health Board (DHB) approached a Community Health Centre (operated by a PHO and located in an area of high deprivation) in 2008 with the aim of developing an initiative to integrate an experienced physiotherapist into the existing Community Health Centre team. The initiative, funded by the DHB, provided a service comparable with the service provided at the city's main hospital. This initiative had several aims, two of which were: 1) provide a primary care musculoskeletal physiotherapy service and 2) improve access to musculoskeletal physiotherapy outpatient services so that they aligned with the demographics of the area. In November 2009, the Health Centre physiotherapy service commenced.

At present, there is a paucity of published New Zealand research reporting on ethnic disparities with respect to musculoskeletal physiotherapy services and initiatives to ameliorate them (Nelson 2002, Ratima et al 2006). The purpose of this study was to determine if a DHB funded service provided within a Community Health Centre was successful in positively changing access to musculoskeletal outpatient physiotherapy services. More specifically, the aims were to retrospectively explore patient attendance records to determine: 1) if a DHB funded musculoskeletal physiotherapy service within the Community Health Centre changed access to musculoskeletal outpatient physiotherapy services overall and by clinic location (Hospital and Health Centre), and 2) if the patients who attended the respective clinics were representative of local community demographics.

METHOD

Data Source

Retrospective data were collected from patient health records of all patients referred for outpatient musculoskeletal physiotherapy at the Community Health Centre and Hospital clinic. Data from patients attending the Hospital musculoskeletal physiotherapy outpatients' service in 2009 and patient data from January 2010 to April 2012 from the Hospital and the Health Centre were collected. Variables of interest were age, ethnicity, sex, deprivation level at first consult, and overall appointment attendance rates from the hospital service. This study was a collaborative project between Hutt Valley District Health Board, Hutt Union and Community Health Services, and the University of Otago, School of Physiotherapy. Ethical approval was granted by the Central Regional Ethics Committee (CEN/12/EXP/022) of New Zealand and by the two service centres (DHB and Hutt Union and Community Health Services) prior to study commencement.

Data Analysis

Prior to analysis, all identifying data were removed to ensure anonymity. After cleaning the data, descriptive statistics were used to assess mean (SD) age, and the frequency (%) of ethnicity, sex, deprivation level at first consult, and overall attendance rate variables. Deprivation levels were categorised into quintiles. Quintiles are derived from the NZDep2006 decile score which was collapsed by adding two sequential deciles such as deciles 1 and 2 to form quintile 1 and so forth (White et al 2008). Decile 1 is the least deprived and 10 the most deprived (Atkinson et al 2014). Accordingly, quintile 5 denotes higher deprivation. Ethnicities were grouped according to Statistics New Zealand Level 1 Ethnicity Classification Coding System (Statistics New Zealand 2009).

Overall attendance rate was defined as the number of treatment sessions a patient successfully attended in relation to the total number of treatment appointments made and was calculated for each patient. Non-attendance was defined as any booked appointment that was not attended regardless of whether this was due to a cancellation or was a missed appointment.

Data analysis was carried out using Microsoft Excel 2010 and the Open Source Epidemiologic Statistics for Public Health (Version 2.3.1) (OpenEpi) software package. A number of correlates associated with decreased access to care, including socioeconomic status, age and ethnicity (Cumming et al 2007) were analysed for both the Health Centre and Hospital populations.

Wilcoxin Signed Rank Tests were used to determine if there was a change in the total number of Māori and Pacific Island patients attending their first DHB funded physiotherapy consult. Independent samples t-tests were used to determine if there was any statistical difference between the age of participants attending the two clinics (Hospital and Health Centre) at first consult. All categorical variables were analysed using chi-squared tests or Fisher's Exact Test to determine statistical significance. Statistical significance was considered reached with p-values of <0.05.

Table 1: Characteristics of patients attending their first consultation at either the Hospital or Health Centre 2009 – 2012

	2009 Jan-Dec	2010 Jan-Dec			2011 Jan-Dec			2012 Jan-Apr		
	Hospital	HC	Hospital	*p*-value	HC	Hospital	*p*-value	HC	Hospital	*p*-value
Total patients	2972	318	2953		358	3000		129	1364	
Age Mean (SD)	48.8 (20)	44.4 (16)	49.3 (20)	<0.001	44.7 (16)	48.5 (20)	<0.001	44.5 (16)	49.8 (19)	<0.001
Sex Freq (%)				<0.001			< 0.001			0.26
Male	960 (32)	162 (51)	924 (31)		165 (46)	926 (31)		51 (40)	472 (35)	
Female	2012 (68)	156 (49)	2029 (69)		193 (54)	2074 (69)		78 (60)	892 (65)	
Quintile Freq (%)				<0.001			<0.001			<0.001
1	492 (17)	13 (4)	497 (17)		9 (3)	493 (16)		4 (3)	212 (16)	
2	266 (9)	6 (2)	236 (8)		2 (1)	229 (8)		5 (4)	115 (8)	
3	576 (19)	23 (7)	595 (20)		31 (9)	587 (20)		9 (7)	252 (18)	
4	1027 (35)	48 (15)	1055 (36)		65 (18)	1091 (36)		12 (9)	457 (34)	
5	612 (21)	224 (70)	570 (19)		235 (66)	600 (20)		95 (74)	328 (24)	
Unknown	0 (0)	4 (1)	0 (0)		16 (4)	0 (0)		4 (3)	0 (0)	
Ethnicity Freq (%)				<0.001			<0.001			<0.001
European	2122 (71)	65 (20)	2150 (73)		78 (22)	2156 (72)		28 (22)	934 (69)	
Māori	376 (13)	107 (3)	332 (11)		101 (28)	378 (13)		41 (32)	171 (13)	
Pacific	179 (6)	86 (27)	194 (7)		113 (32)	190 (6)		31 (24)	97 (7)	
Asian	183 (6)	14 (4)	196 (7)		22 (6)	204 (7)		8 (6)	105 (8)	
MELAA	54 (2)	41 (13)	51 (2)		32 (9)	46 (2)		16 (12)	41 (3)	
Other	0 (0)	5 (2)	0 (0)		11 (3)	0 (0)		5 (4)	0 (0)	
Residual	59 (2)	0 (0)	30 (1)		0 (0)	26 (1)		0 (0)	16 (1)	

Note: Freq, Frequency; Jan, January; Dec, December; Apr, April; HC, Health Centre; MELAA, Middle Eastern, Latin American, African

RESULTS

Table 1 outlines the demographic composition of the sample population at the Health Centre and Hospital between 2009 and April 2012. There was a 132%, a 127%, and a 124% increase in the number of patients identifying as Māori and a 144%, a 159%, and a 131% increase in the number of patients identifying as Pacific Island attending their first DHB funded physiotherapy consult. This was not found to be significant. However, significant differences were found between the Health Centre and Hospital for the variables of sex, age, quintile and ethnicity in 2010, 2011, and 2012.

A significant difference ($p<0.001$) was found for sex distribution between the Health Centre and Hospital in 2010 and 2011. The Hospital had a consistently higher proportion of female patients than males for all years, while the Health Centre had a relatively equal distribution of males and females over the three years.

The mean age of patients remained consistent over the three years at both locations. The Hospital had a higher mean age compared to the Health Centre for 2010 to 2012 ($p<0.001$).

A significant difference ($p<0.001$) in the quintile distribution for the Health Centre and Hospital was also identified. Over 80% of patients at the Health Centre were categorised as quintile five, compared to a more heterogeneous quintile distribution at the hospital.

A significant difference between the ethnic distributions of the Health Centre and Hospital was found for all years. The highest proportion of patients at the Hospital consistently identified as NZ European (2009: 71.4%; 2010: 72.8%; 2011: 71.9%, 2012: 68.5%). Conversely, the Health Centre results showed that patients identifying as Māori and Pacific Island formed the largest proportion of the patients seen (2010: 34% and 27%; 2011: 32% and 28%: 2012: 24% and 32% respectively). In addition, the Health Centre had higher proportions of patients identifying as MELAA compared to the hospital over all three years.

In 2009, a total of 2,972 patients attended their DHB funded initial musculoskeletal physiotherapy outpatients consult (Hospital only). This increased to 3271 and 3358 for the full years of 2010 and 2011 respectively (attendance at Hospital and Health Centre combined). All patients had the opportunity to access either clinic and, in some instances, both services were accessed by the same patient.

Table 2 shows the booking and attendance data for the Health Centre and Hospital, and represents the total number

of appointments (initial consult and follow-ups) made. Over 50,065 appointments were made between January 2009 and April 2012; 47,285 of these were booked at the Hospital while 2,780 were booked at the Health Centre (January 2010 and April 2012). In total 8,860 individual patient appointments were made from 2009 to April 2012. While the total number of appointments increased year on year (2009: 13,072; 2010: 15,367; 2011: 15,909) there was no significant change in the overall attendance rates for all appointments made over all years at both locations.

Table 2: Attendance data for the Hospital and Health Centre 2009 - 2012

	Hospital appointments	Health Centre appointments	Total appointments	*p*-value
Year				
2009 Jan-Dec				
Booked	13,072		13,072	
Attended	11,444		11,444	
Not attended	1,628		1,628	
2010 Jan-Dec				
Booked	14,090	1,277	15,367	
Attended	12,389 (88)	1,003 (79)	13,392	
Not attended	1,701 (12)	274 (21)	1,975	0.09
2011 Jan-Dec				
Booked	14,799	1,110	15,909	
Attended	12,771 (86)	853 (77)	13,624	
Not attended	2,028 (14)	257 (23)	2,285	0.10
2012 Jan-Apr				
Booked	5,324	393	5,717	
Attended	4,612 (87)	310 (79)	4,922	
Not attended	712 (13)	83 (21)	795	0.13

Note: All figures are reported as Frequency (%) except for total values. Jan, January; Dec, December; Apr, April.

Table 3 represents the number of appointments (initial consult and follow-ups) attended and not attended at the Health Centre and Hospital by ethnic group. European patients contributed to the majority of attended appointments at the Hospital for all years (59-64%). At the Health Centre, the highest percentage of attendance was for patients identifying as Māori, followed by Pacific Island and European ethnicities. Significant differences were found over all three years between both clinics.

Non-attendance proportions remained fairly consistent at both clinics for all years (Table 3). At the Hospital, the highest non-attending rate was found amongst patients identifying as European patients followed by Māori patients. The Health Centre data showed the greatest proportions of patients not attending appointments were Māori and Pacific ethnicities. Compared to the Hospital, the Health Centre had a higher rate of non-attendance amongst the MELAA population.

DISCUSSION

This study aimed to compare the characteristics of patients attending musculoskeletal physiotherapy at two DHB funded musculoskeletal physiotherapy outpatient clinics between January 2009 and April 2012. Specifically, the study assessed if the implementation of a physiotherapy clinic strategically placed within the 'local' Community Health Centre resulted in a change in access statistics and whether the patient population became representative of local community demographics. Our results indicate that the Health Centre caters for a lower socioeconomic patient population, and more people identifying as Māori and Pacific Island (who have a lower mean age) compared to patients attending the Hospital. Following the implementation of the new physiotherapy service, there was, across both services, a consistent increase of initial consults attended from 2009 to 2011, over a 100% increase in the number of patients of Māori and Pacific Island ethnicity attending their initial consult, and a significant increase in the number of patients who live in a high deprivation area attending their initial consult. Furthermore, the ethnic proportion of patients attending physiotherapy at the Health Centre became more aligned to local demographics (Statistics New Zealand 2006, Statistics New Zealand 2014). No previous research, to the authors' knowledge, has reported the outcomes of incorporating a DHB funded physiotherapy service into a primary care practice located in a deprived area in New Zealand.

A link exists between the provision of community health services and increased rates of receiving care (Bindman et al 1995). That is, the largest documented increase in the use of primary health care has been by the least deprived populations and Māori are under-represented compared with non-Māori in this instance (Cumming et al 2007). Following the introduction of the Community Health Centre physiotherapy service, not only did the ethnic distribution of physiotherapy attendance by patients identifying as Māori and Pacific Island become more consistent

Table 3: Total attended and not-attended appointments at the Hospital and the Health Centre 2009 – 2012 by ethnicity

	2009 Jan-Dec	2010 Jan-Dec			2011 Jan-Dec			2012 Jan-Apr		
	Hospital	Hospital	HC	*p*-value	Hospital	HC	*p*-value	Hospital	HC	*p*-value
Total attended	11,443	12,389	1,003		12,771	853		4,612	310	
Ethnicity Freq (%)				<0.001			<0.001			<0.001
European	8,741 (76)	9,529 (77)	244 (24)		9,703 (76)	215 (25)		3,244 (70)	53 (17)	
Māori	1,026 (9)	1,059 (9)	299 (30)		1,122 (9)	192 (23)		499 (11)	97 (31)	
Pacific	547 (5)	711 (6)	247 (25)		649 (5)	265 (31)		281 (6)	79 (25)	
Asian	749 (7)	819 (7)	53 (5)		986 (8)	59 (7)		358 (8)	26 (8)	
MELAA	194 (2)	179 (1)	136 (14)		198 (2)	82 (10)		172 (4)	41 (13)	
Other	0 (0)	0 (0)	24 (2)		0 (0)	40 (5)		0 (0)	14 (4)	
Residual	187 (2)	92 (1)	0 (0)		113 (1)	0 (0)		58 (1)	0 (0)	
Total not-attended	1,628	1,701	274		2028	257		712	83	
Ethnicity Freq (%)				<0.001			<0.001			<0.001
European	1,002 (62)	1,081 (64)	59 (21)		1,256 (62)	41 (16)		417 (59)	15 (18)	
Māori	282 (17)	294 (17)	99 (36)		385 (19)	78 (30)		152 (21)	28 (34)	
Pacific	155 (10)	192 (11)	66 (24)		215 (11)	88 (34)		80 (11)	19 (23)	
Asian	109 (7)	86 (5)	8 (3)		119 (6)	13 (5)		41 (6)	7 (8)	
MELAA	53 (3)	40 (2)	36 (13)		49 (2)	28 (11)		13 (2)	8 (10)	
Other	0 (0)	0 (0)	6 (2)		0 (0)	9 (4)		0 (0)	6 (7)	
Residual	27 (2)	8 (1)	0 (0)		4 (0)	0 (0)		9 (1)	0 (0)	

Note: Freq, Frequency; Jan, January; Dec, December; Apr, April; HC, Health Centre; MELAA, Middle Eastern, Latin American, African

with the suburb the Health Centre is geographically located within, but other minority ethnic populations also became more consistent. For example, 2006 and 2014 Census data show that in this particular geographical area over 26% of people identify as Māori, 21% Pacific Islander, and 10% MELAA.

In contrast, the demographics of patients attending the hospital were not consistent with the city's overall demographics. The city's population is comprised of European (> 64%), Māori (>17%), Pacific Islander (>11%) and Asian (>9%) people (Statistics New Zealand 2006, Statistics New Zealand 2014). Previous research has shown that attending services which require transport can limit access to services, especially in low income groups (Listl et al 2014, Mbada et al 2013, Winkley et al 2014). Although it is simply conjecture with regards to the population involved in this research, these results suggest that people are more likely to attend a physiotherapy clinic which is located in close proximity to their physical address.

Our results also showed that there was a significantly higher mean age of patients accessing the Hospital compared to the Health Centre. This age differential is not unexpected. Māori have a lower life expectancy of about seven years compared to non-Māori (Statistics New Zealand 2004) and a higher proportion of Māori patients accessed the Health Centre.

No significant differences were found when comparing total attendance and non-attendance data between the two clinics over the research period. However, when attendance based on ethnic grouping was analysed, significant differences were identified. One key finding was that the Hospital had a higher proportion of patients identifying as Māori not-attending compared to the proportion of Māori accessing the service. This was noticeable for all years studied. Conversely, the Health Centre had similar attendance and non-attendance rates representative of the proportion of patients making appointments. Improvements in the overall attendance rate may be due to the location of the new service, however, it could also be related to other factor(s).

The introduction of the physiotherapy clinic within the strategically located Health Centre resulted in significantly more deprived (quintile five) patients making physiotherapy appointments at the Health Centre and receiving DHB funded care. Although the Hospital physiotherapy service is also DHB funded and thus free of charge, travel costs involved and additional time requirements for travel may have been factors in non-attendance, particularly for patients living in an area categorised as high deprivation. Maniapoto and Gribben (2005) also found that the addition of Māori health facilities into a high needs community increased the access to health services. These authors hypothesised that addressing barriers such as cost, lack of transport, cultural acceptability, community specific needs, and the location of the clinic supplemented the success of the clinic (Maniapoto and Gribben 2005).

Physiotherapists infrequently work within interprofessional primary health care teams in New Zealand (Stewart and Haswell 2013). Within primary health care, community governed organisations are more likely to recruit a variety of health disciplines while independent practices are less likely to employ a variety of health care practitioners or ethnicities (Crampton et al 2005). The creation of PHOs facilitated the inclusion of multiple health care professionals into health care practices and encouraged diversity (Ministry of Health 2011a). The interprofessional nature of the Health Centre involved in this study reflects the structure of a typical community based, non-profit organisation described by Crampton et al (2005). All the health professionals who work at the Health Centre make a conscious effort to work as an interdisciplinary team and will frequently 'door knock' on other clinicians' doors to ask advice or to introduce a patient they intend to refer. These sorts of interactions may have helped to break down some of the cultural and language barriers described by Maniapoto and Gribben (2005)

The physiotherapists who worked at the Health Centre during the period of this research were British and completed their undergraduate training in England. Both physiotherapists had worked with various minority groups previously and had demonstrated cultural competency to a sufficient extent to gain New Zealand Physiotherapy Board Registration. However, our results may have been different if the physiotherapists working in the Health Centre had been of an ethnicity similar to the minority groups living in this area. The magnitude and direction of change, if any, the physiotherapists' ethnicity had on our results is unable to be determined from this research.

This study has a number of limitations. We used a retrospective design. It is possible that the data collected were incomplete and contained inaccuracies and this may have biased our results. While there was a constant increase in appointments made over the time span of this study, it is not known whether these 'new' patients were previously receiving care from other physiotherapy service providers, or if results comprise of patients accessing physiotherapy for the first time and therefore represent a true increase in physiotherapy access. In addition, despite a large number of total patients (8,860) and individual appointments (50,065), there was a considerable difference in sample size between the Health Centre and Hospital due to the number of full time equivalent staff working at the two sites. Approximately two and a half full time equivalent physiotherapists were on site at the Hospital during the data collection time frame compared to one physiotherapist employed part time (50%) at the Health Centre. Consequently, attendance proportions were used to compare factors between the two locations. Further, some results are drawn from only two full years of physiotherapy service provision as data for 2012 were only collected up till the end of April. This made it difficult to ascertain significant findings between the two clinics.

Health disparities which exist between different groups are multi-factorial (Braveman and Gruskin 2003). The existence of financial, organisational and cultural barriers places an increasing burden on those who are already socially disadvantaged with respect to their health and negatively affects access (Braveman and Gruskin 2003). Some of the known barriers to access are inconvenient opening hours of clinics, limiting in particular people employed in lower income occupational roles who can ill afford the time off work and who frequently work long hours (Jansen et al 2008). Travel time related to the distance of the clinic in addition to the cost of transport, which might include parking fees are also acknowledged barriers, and these barriers fall most heavily on low-income groups (Jansen et al 2008). Language and cultural obstacles (Bindman et al 1995, Jansen et al 2008, Whitehead 1992) and a frequent lack of awareness amongst minority groups of the health care services that are available are also barriers (Braveman and Gruskin 2003, Whitehead 1992). It is possible that the Health Centre mitigated some or all of these factors. Future research should identify why the addition of a physiotherapy service into the Health Centre specifically increased the number of Māori (and other minority ethnicities), and those living within a high deprivation area, accessing DHB funded physiotherapy services. Funding to continue data collection and analysis over a greater length of time would be useful for identifying the long term effects of DHB funded community based physiotherapy services on musculoskeletal and general health outcomes.

CONCLUSION

A DHB funded musculoskeletal outpatient physiotherapy service was incorporated into an interdisciplinary primary health care team located within a Community Health Centre with the aim of improving physiotherapy access for minority populations. A significant increase in the number of minority group and lower socioeconomic patients receiving DHB funded physiotherapy treatment resulted and has potentially mitigated several barriers to access. However, further research is required to confirm which barriers remain and what, if anything, can be done to further improve access to this service.

KEY POINTS

- The inclusion of DHB funded musculoskeletal physiotherapy services within a Community Health Centre located within a geographical area defined as high deprivation can significantly improve access for minority groups.
- Convenience, a decrease in financial and travel costs, and inclusion of physiotherapy within an already established interprofessional team may have mitigated barriers to access.
- Further research is required to determine why this service was successful.

PERMISSIONS

Ethics - Ethical approval was granted by the Central Regional Ethics Committee (CEN/12/EXP/022) of New Zealand.

DISCLOSURES

No funding was obtained for this study.

I declare on behalf of myself and the other authors that we know of no competing interests (financial, professional or personal) which may be perceived to interfere with or bias any stage of the writing or publication process. This includes, but is not restricted to, any factors that may influence full and objective presentation of the article, peer review and editorial decisions.

ACKNOWLEDGMENTS

This study would not have been possible without the cooperation of Hutt Valley District Health Board, the Therapies team at Hutt Hospital, the staff at Pomare Hutt Union and Community Health Service, and the University of Otago, School of Physiotherapy. The authors would like to acknowledge in particular Sally Nichol at Hutt Union Community Health Service and Sue Doesburg, Professional Leader – Physiotherapy, Hutt Valley and Wairarapa DHB for their support.

CORRESPONDING AUTHOR

Dr Meredith Perry, School of Physiotherapy, University of Otago - Wellington, PO Box 7343, Wellington 6242, New Zealand. Telephone: 04 3855357. Email: meredith.perry@otago.ac.nz

REFERENCES

Ajwani S, Blakely T, Robson B, Bonne M, Tobias M (2003) Decades of disparity: Ethnic mortality trends in New Zealand 1980–1999 (1st edn). Wellington, New Zealand: Ministry of Health. http://www.wnmeds.ac.nz/nzcms-info.html [Accessed July 15, 2012].

Atkinson J, Salmond C, Crampton P (2014) NZDep2013 Index of Deprivation. Wellington, New Zealand: University of Otago. http://www.otago.ac.nz/wellington/otago069936.pdf [Accessed January 10, 2015].

Barnes S, Stevens M, Nixon S (2012) Equitable access to rehabilitation: Realizing potential, promising practices, and policy directions. A discussion paper (1st edn). Toronto, Canada: Wellesley Institute and Canadian Working Group on HIV and Rehabilitation.

Baxter J (2002) Barriers to health care for Maori with known diabetes: A literature review and summary of the issues (1st edn). Te Roopu Rangahau Hauora a Ngai Tahu.

Bindman AB, Grumbach K, Osmond D, Komaromy M, Vranizan K, Lurie N, Billings J, Stewart A (1995) Preventable hospitalizations and access to health care. *Journal of the American Medical Association* 274: 305–311. DOI: 10.1001/jama.1995.03530040033037.

Braveman P, Gruskin S (2003) Defining equity in health. *Journal of Epidemiology and Community Health* 57: 254–258. DOI: 10.1136/jech.57.4.254.

Brown RE, Ojeda VD, Wyn R, Levan R (2000) Racial and ethnic disparities in access to Health Insurance and Health Care (1st edn). Los Angeles, CA: UCLA Center for Health Policy Research and the Henry J. Kaiser Family Foundation.

Cambridge Dictionaries Online (2014) http://dictionary.cambridge.org/dictionary/british/marginalize [Accessed April 01, 2015].

Cram F (2007) Hauora Māori Standards of Health IV. A study of the years 2000-2005 (1st edn). Wellington: Te Ropu Rangahau Hauora a Eru Pomare.

Crampton P, Davis P, Lay-Yee R (2005) Primary care teams: New Zealand's experience with community-governed non-profit primary care. *Health Policy* 72: 233–243. DOI: 10.1016/j.healthpol.2004.08.003.

Cumming J, Gribben B, Primary Health Care Strategy Evaluation Research Team (2007) Evaluation of the Primary Health Care Strategy: Practice Data Analysis 2001-2005. Wellington, New Zealand: Health Services Research Centre. http://www.nzdoctor.co.nz/media/6476/PHCSE%20FINAL.pdf [Accessed July 27, 2012].

Jansen P, Bacal K, Crengle S (2008) He Ritenga Whakaaro: Māori experiences of health services (1st edn). Auckland, New Zealand: Mauri Ora Associates.

King HA (2001) The Primary Health Care Strategy. Wellington.: Ministry of Health. http://www.health.govt.nz/ [Accessed July 25, 2012].

Lasser KE, Himmelstein DU, Woolhandler S (2006) Access to care, health status, and health disparities in the United States and Canada: results of a cross-national population-based survey. *American Journal of Public Health* 96: 1300–1307. DOI: 10.2105/AJPH.2004.059402.

Levesque J-F, Harris MF, Russell G (2013) Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *International Journal for Equity in Health* 12: 1-9. DOI: 10.1186/1475-9276-12-18. http://www.equityhealthj.com/content/12/1/18 [Accessed April 8, 2015].

Listl S, Moeller J, Manski R (2014) A multi-country comparison of reasons for dental non-attendance. *European Journal of Oral Sciences* 122: 62-69. DOI: 10.1111/eos.12096.

Maniapoto T, Gribben B (2005) Establishing a Māori case management clinic. *New Zealand Medical Journal* 116: 1160-1169.

Mbada CH, Ajayi O, Agbeja OB, Mbada KA, Awotidebe TO, Oghumu SN (2013) Non-attendance for out-patient physiotherapy: Evaluation, prediction and physiotherapists' perceptions - a cross-sectional study. *Journal of Physical Therapy* 7: 12-22.

Ministry of Health (2011a) Better, Sooner, More Convenient Health Care in the Community. Wellington: Ministry of Health. http://www.health.govt.nz/publication/better-sooner-more-convenient-health-care-community [Accessed July 20, 2012].

Ministry of Health (2011b) Services to improve access. http://www.health.govt.nz/our-work/primary-health-care/primary-health-care-services-and-projects/services-improve-access [Accessed July 25, 2012].

Ministry of Health (2012) The health of New Zealand adults 2011/12: Key findings of the New Zealand Health Survey. Wellington: Ministry of Health. www.health.govt.nz [Accessed April 08, 2015].

Ministry of Health and Accident Compensation Corporation (2013) Injury-related Health Loss: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study 2006–2016. Wellington: Ministry of Health. http://www.acc.co.nz/PRD_EXT_CSMP/groups/public/documents/reports_results/wpc119010.pdf [Accessed April 08, 2015].

Nelson A (2002) Unequal treatment: Confronting racial and ethnic disparities in health care. *Journal of the National Medical Association* 94: 666–668.

Ratima M, Waetford C, Wikaire E (2006) Cultural competence for physiotherapists: reducing inequalities in health between Māori and non-Māori. *New Zealand Journal of Physiotherapy* 34: 153-159.

Statistics New Zealand (2004) Life expectancy and death rates. http://www2.stats.govt.nz/domino/external/web/nzstories.nsf/ [Accessed July 25, 2012].

Statistics New Zealand (2006) 2006 New Zealand Census. http://www.stats.govt.nz/Census/2006CensusHomePage.aspx [Accessed June 25, 2012].

Statistics New Zealand (2009) Statistical Standard for Ethnicity. Wellington: Statistics New Zealand. http://www.stats.govt.nz/surveys_and_methods/methods/classifications-and-standards/classification-related-stats-standards/ethnicity.aspx [Accessed August 23, 2012].

Statistics New Zealand (2014) New Zealand Census 2013. http://www.stats.govt.nz/Census/2013-census.aspx [Accessed October 10, 2014].

Stewart J, Haswell K (2013) Assessing readiness to work in primary health care: the content validity of a self-check tool for physiotherapists and other health professionals. *Journal of Primary Health Care* 5: 70–73.

Westbrooke I, Baxter J, Hogan J (2001) Are Maori under-served for cardiac interventions? *New Zealand Medical Journal* 114: 484-487.

White P, Gunston J, Salmond C, Atkinson J, Crampton P (2008) Atlas of Socioeconomic Deprivation in New Zealand NZDep2006. Wellington: Ministry of Health, Statistics New Zealand.

Whitehead M (1992) The concepts and principles of equity and health. *International Journal of Health Services* 22: 429–445. DOI: 10.2190/986L-LHQ6-2VTE-YRRN.

Winkley K, Evwierhoma C, Amiel SA, Lempp HK, Ismail K, Forbes A (2014) Patient explanations for non-attendance at structured diabetes education sessions for newly diagnosed Type 2 diabetes: a qualitative study. *Diabetic Medicine*. DOI: 10.1111/dme.12556.