



Original Article

Blood pressure screening in an Australian osteopathy student-led clinic



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ARTICLE INFO

Article history:

Received 26 October 2017

Received in revised form

22 November 2017

Accepted 28 November 2017

Keywords:

Hypertension

Osteopathic medicine

Complementary medicine

Public health

ABSTRACT

Objectives: Approximately 25% of the Australian population are hypertensive, contributing 5% to the total burden of disease in Australia. The measurement of blood pressure (BP) and management of hypertension is relatively straightforward, and is a modifiable risk factor for cardiovascular disease. Given the prevalence of hypertension in the community, osteopaths are in a position to be able to measure BP and do so in routine practice. The present study sought to identify the frequency of blood pressure measurement of patients attending a student-led osteopathy clinic.

Method: New patients attending the Victoria University (VU) Osteopathy Clinic between March and June 2016 completed a demographic and health information questionnaire prior to their initial consultation. During the initial consultation students are asked to measure the patients BP and record this in the clinical history, this is a routine part of their standard osteopathy consultation.

Results: BP measurements were available for 31.2% (n = 129) of new patients attending the VU Osteopathy Clinic, 68.8% of new patients did not have BP measurements recorded. Of those patients whose blood pressure was recorded, approximately 25% were classified as hypertensive. Age, gender and cardiovascular history did not appear to influence whether BP was recorded.

Conclusions: Nearly 70% of patients did not have their BP recorded. Future research should evaluate the reasons for student osteopaths not measuring and/or recording new patients BP, and whether these reasons are modifiable. Changes in the curricula and training of clinical educators may be required to increase the clinical practice of measuring BP in student-led clinics.

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Introduction

Globally, cardiovascular disease (CVD) accounts for approximately 17 million deaths per year, which equates to nearly one third of the total deaths [1]. Hypertension is a condition in which the blood vessels are exposed to persistently raised pressures, and is the leading single risk-factor for disease globally, accounting for 9.4 million deaths in 2010 [2] and contributing to approximately 45% of all cardiovascular deaths [3]. In 2008, worldwide, approximately 40% of adults aged 25 and above had been diagnosed with hypertension [1]. It is the most common diagnosis in the primary health care setting, affecting approximately 1 in 3 adults [3]. The

increasing prevalence of hypertension is attributed to population growth, ageing and other risk factors such as poor diet, lack of physical activity, obesity and persistent stress [3]. Without management, it is a major risk factor for stroke, coronary heart disease, kidney disease and chronic heart failure [4,5].

As part of the 2014–15 Australian National Health Survey [6], respondents were asked if they had received a diagnosis of hypertension from a medical professional, with 11.3% (2.1 million) of Australians reporting having hypertension. The face-to-face data collection in the 2014–15 National Health Survey [6] allowed for the measurement of blood pressure at the time of interview. Survey respondents over the age of 18 years "... also had their blood pressure measured. Numbers of people with high blood pressure ... [does] not include people who have high blood pressure but are managing their condition through the use of blood pressure medications" [6]. Overall, 23% of Australians (4.1 million people) had

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measured hypertension, representing a 5% contribution to the total burden of disease in Australia, and an increase from the 2011–12 survey (21.5%) [6]. Nearly three-quarters of those with measured hypertension at the face-to-face interview included in the National Health Survey did not report having received a diagnosis of hypertension suggesting they were unaware, or did not consider it a problem [6]. Most 18–34 year old's (96.5%) with high BP, as measured in the 2014–15 survey, did not report having hypertension [6]. These results suggest the potential for undiagnosed and unrecognized hypertension amongst the population, even in younger age groups, to be high.

Vascular events associated with hypertension are a significant burden to the Australian healthcare system and this could be reduced if more patients were identified and treated. Although hypertension is easy to diagnose and inexpensive to treat, a significant gap has been documented between recommended and received care [7]. Some authors suggest that primary health care physicians may not be proactive in detecting and managing hypertension and are willing to accept an elevated systolic BP in their patients [7–9].

Osteopathy in Australia is a primary contact profession, that is, a patient does not need a referral to an osteopath [10]. Consequently a patient may not have presented to their general practitioner (GP) in the recent past to have their BP assessed – blood pressure assessment is a routine part of Australian general practice [11]. Further, Australian osteopaths participate in a government-funded scheme to provide care for patients with chronic health complaints [12], and a substantial number of patients attending GP's present with co-morbid conditions [10]. Therefore, it is important that BP be monitored in the osteopathy clinical setting regardless of whether the patient is referred by their GP or other. Additionally, conditions such as a cervical artery dissection may mimic a cervical spine musculoskeletal complaint [13–16]. The *International Framework for Examination of the Cervical Region for Potential of Cervical Arterial Dysfunction Prior to Orthopaedic Manual Therapy Intervention* [15] advocates the screening of BP as part of the assessment of cervical spine complaints, as have other authors [17,18]. The present study, sought to identify the frequency of blood pressure measurement of patients attending a student-led osteopathy clinic for their initial consultation. A further aim was to ascertain if BP measurement frequency was related to the patients' cardiovascular history, or risk factors for cardiovascular events.

Methods

Ethics approval for this study was provided by the Victoria University (VU) Human Research Ethics Committee. All new patients attending the VU Osteopathy Clinic between March 2016 and June 2016 completed a patient demographics and health information questionnaire prior to their initial consultation. The questions addressed sociodemographic variables related to health literacy, life-satisfaction, self-reported general health status, diet, exercise and history of chronic diseases. These questions have been used in a previous study in the same setting exploring health literacy of patients attending the clinic [19], and are identified in the Australian National Health Survey as health determinants that are related to the onset and severity of chronic disease [6,20].

The VU Osteopathy Clinic (Australia) is a student-led teaching clinic for osteopathy students at two locations; central Melbourne City and St Albans. During their initial consultation, the treating year 4 or 5 student was asked to evaluate the patient's BP and record this in the clinical history on the patient management system. The measurement of BP was expected to be carried out with patients attending the clinic on a routine basis. BP measurements were taken using an aneroid sphygmomanometer (wall mounted

or hand held). Using these instruments in a clinical setting has previously been demonstrated to provide accurate and reliable non-invasive readings [4]. All student clinicians have been taught to take BP and assessed on their proficiency as part of their year 2 and 3 pre-clinical training. As standard practice and in this study those patients identified as hypertensive were referred to their GP for assessment and management.

Demographic and health information data were extracted from the patient demographics and health information questionnaire by a single researcher (BV). All new patients are informed on the patient demographic questionnaire that their deidentified information may be used for research purposes, and that they can opt-out of this if they wish to do so, by selecting this option preference on the questionnaire. Only one of the researchers (BV), could identify the patient prior to data extraction, this was required to locate the patient's clinical history and extract the blood pressure measurement where it was recorded. Once the data were extracted, it was not possible to identify the patient and any identifying data were securely destroyed. Data were then entered into SPSS version 21 (IBM Corp, USA) for analysis. BP measurements were classified according to the *Guideline for the diagnosis and management of hypertension in adults–2016* [4]. Descriptive statistics were generated for the demographics and health information questions and BP measurements. Non-parametric statistics were used to evaluate whether recording of blood pressure was influenced by patient age, gender, history of cardiovascular complaints, smoking status, exercise, self-reported general health and satisfaction with life (alpha set at $p < 0.05$).

Results

There were four hundred and twenty-seven ($N = 427$) new patient consultations completed during the data collection period, March to June 2016. Data from 413 patients were available for the analysis as 14 patients indicated they did not wish to have their health information used as part of this study. Demographic data for the remaining 413 patients is presented in Table 1. Mean age of the patient cohort was 33.5 years (± 12.3 years) with a range from 18 to 77 years. Patients were categorised into age groups according to the Australian Bureau of Statistics classifications used to analyse health data [20].

BP measurement

BP measurements were available for 31.2% ($n = 129$) of new patients attending the VU Osteopathy Clinic during the study period with 77 (59.6%) being female and 52 (40.4%) male. Of those patients whose BP was measured and recorded, 28.8% of males and 20.7% of females were *high-normal* or above. There was no significant difference for patient gender ($p = 0.25$), age ($p = 0.21$), smoking ($p = 0.14$), exercise ($p = 0.15$), general health ($p = 0.15$) or satisfaction with life ($p = 0.25$) as to whether the BP was recorded or not. Fig. 1 demonstrates the breakdown by age group as to whether the BP was recorded on the initial consultation.

Patients were asked to indicate on their health demographics questionnaire if they were currently experiencing, or previously experienced, cardiovascular complaints. BP measurement classification with regard to this question is demonstrated in Table 2. There was no significant difference for recording of BP in relation to cardiovascular history ($p = 0.19$). Of the 113 patients who reported no cardiovascular history, 23 (20%) had a higher than *normal* BP measurement at their initial osteopathy consultation. This result suggests that patients may present to the VU Osteopathy Clinic with no history of cardiovascular symptoms, or currently being managed for a cardiovascular complaint, but still demonstrate a BP

Table 1	
Demographic data for patients attending the VU Osteopathy Clinic (N = 413).	
Gender	
Male	158 (38.5%)
Female	252 (61.5%)
Born in Australia	
Yes	277 (68.2%)
No	129 (31.8%)
Speak English at home	
Yes	377 (92.2%)
No	32 (7.8%)
Live alone	
Yes	52 (13.1%)
No	345 (86.9%)
Private health	
Yes	174 (42.9%)
No	232 (57.1%)
Smoker	
Yes	44 (11.1%)
No	352 (88.9%)
Highest level of education attended^a	
High School (not complete)	16 (3.9%)
High school (complete)	43 (10.6%)
TAFE/Trade	55 (13.5%)
University	292 (71.9%)
Serves of fruit each day (median)	2
Serves of vegetables each day (median)	2
Exercise sessions per week (median)	3
BP checked in the last 6 months	
Yes	231 (57.8%)
No	169 (42.2%)
Skin cancer check in last 6 months	
Yes	61 (15%)
No	346 (85%)
Healthcare card^a	
Yes	166 (41.2%)
No	236 (58.6%)
General health (median)	3 (range 1–5)
Satisfaction with life (median)	4 (range 1–5)

^a Percentages that do not add to 100% indicate missing data.

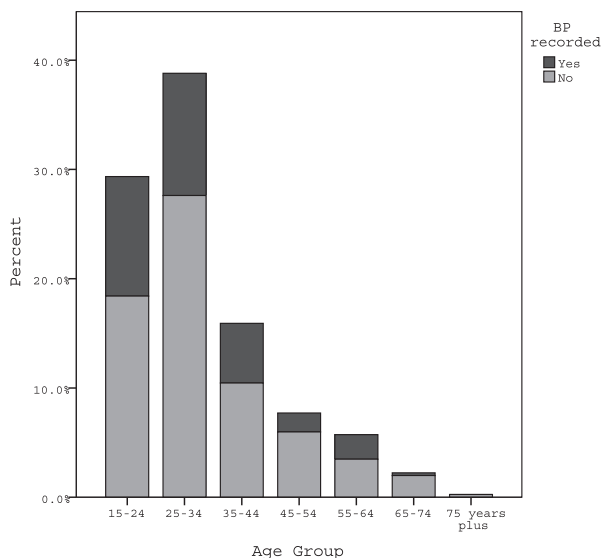


Fig. 1. Blood pressure measurement at the initial osteopathy consultation.

measurement higher than *normal*. Blood pressure classification for the cohort is presented in Fig. 2.

Table 3 outlines the BP measurement by age group intervals in relation to whether the patient reported having had their BP measured within the last 6 months by a health professional. Just over 40% of all new patients had not had their BP taken in the last 6

months. The results show that of those who had their BP taken within the previous 6 months, only 72 (31.44%) had their BP recorded in the new patient clinical history on the first consultation with the student osteopath, whilst 157 (68.56%) did not have a recording in their new patient clinical history. Of those 164 new patients who had not had their BP taken within the 6 months prior to attending the VU Osteopathy Clinic, only 51 (31.1%) had their BP recorded by the student osteopath, with 113 (68.9%) not having a recording noted in their clinical history. From the group who had their BP taken by the student osteopath 12 patients (23.53%) were found to have BP readings above the normal range.

Discussion

The present study set out to explore the frequency with which BP was being screened in patients attending an Australian student-led osteopathy clinic. Overall there were patients presenting to the clinic with either unidentified hypertension or hypertension that may not be appropriately identified and managed. The present study only sought to screen BP to identify if patients were hypertensive albeit this was not their presenting complaint. The cause of a patients' hypertension, or an in-depth evaluation of the cardiovascular history was not undertaken in the present study. As Australian osteopaths are primary contact health professionals, it is incumbent on the treating health professional from a public health standpoint, to measure a patient's BP to identify potential undiagnosed hypertension and refer appropriately.

Attending the clinic provides the osteopathy student with an opportunity to screen the BP of a subset of the population who otherwise may not have had their BP measured, or not recently had it measured, potentially missing out on an earlier identification of hypertension. Nearly half of the patients presenting to the clinic in the data collection period reported not having their BP assessed in the 6 months prior to presentation. Of these patients who had their BP recorded by the student osteopath, 12 (3%) had either a *high-normal* (n = 7) or *grade 1* (n = 5) BP classification. These patients were all less than 44 years of age, suggesting there may be value in measuring BP in all patient groups presenting to the clinic.

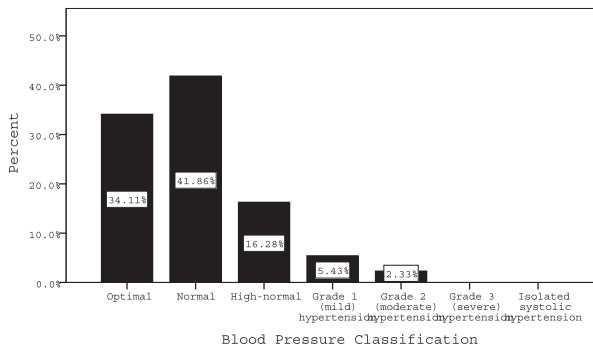
The mean age of patients attending the clinic was 33.5 years (± 12.3 years). This younger to middle age group may not have sought care from their GP within the recent past and may not have had their BP measured. Australia's Health Survey data from 2011 to 2012 [21] reported that high BP (>140 mmHg systolic and/or >90 mmHg diastolic) was present in 10% of people aged 18–44. In the present study 6% (n = 8) of those patients in this age group who had their BP measured were classified as hypertensive. The lower percentage may reflect the number of BP recordings undertaken in the clinic not providing an accurate indication as to the prevalence in this age group.

Of the patients attending the VU Osteopathy Clinic, 27.4% of males & 21.1% of females were classified as *hypertensive*. This is relatively consistent with the Australia's Health 2016 [6] data showing 24% of males and 22% of females are hypertensive. Howes et al. [22] reported that patient age, gender and comorbidities influence decisions about identification and management of hypertension by Australian GP's. The present study did not identify any significant difference for gender, age, smoking status and cardiovascular history with regard to whether BP was recorded or not. The present study also suggests that patient-reported general health status and satisfaction with life did not influence whether BP was recorded or not. That said, it is incumbent on practitioners to identify those risk factors in the clinical history they may be associated with other comorbidities, and to also assess a patients' BP in the absence of these cardiovascular risk factors.

Taylor and Kerry [18] showed the relevance of BP measurement

Blood pressure classification according to a current or past history of cardiovascular complaints (n = 129).

BP Classification	Self-reported cardiovascular history			
	None	Currently experiencing	Previously experienced	Current & previous history
Optimal	40	2	2	
Normal	51	1	2	
High-normal	14	3	2	2
Grade 1 hypertension	6	1		
Grade 2 hypertension	3			



in manual therapy by presenting three different case studies of patients, presenting to manual therapists with a complaint of cardiovascular origin. These patients varied in age (32, 56 & 72 years of age) and presentation. This clinical data suggests that it is necessary for manual therapists to conduct BP readings and other medical examinations, on all patients who present to their practice, as cardiovascular complications can manifest as musculoskeletal complaints [18]. The current results suggest that routine screening of BP by osteopaths would be of value from a clinical reasoning and public health standpoint. Patients who are identified as hypertensive could be referred to their GP for management, or to hospital accident and emergency in more severe cases.

The primary limitation of this data analysis was a small sample size. Although patient compliance with completing the demographic and health information data was high, practitioner

Although the demographics of patients presenting to the VU Osteopathy Clinic are relatively consistent with private Australian osteopathy practices [10,23], it is important for future studies to analyse private osteopathy clinics to ascertain if the prevalence of hypertension is consistent with the present cohort. Such a study would also identify if the measurement of BP is routine in daily osteopathy practice. It may be that routine measurement is not part of daily practice, therefore clinical supervisors are possibly not reinforcing the need to perform it as they are not performing this clinical task themselves.

Future studies could include a focus on attitudes and barriers/enablers to taking BP in both Australian osteopathy practices and student-led clinics. An understanding of the low number of BP recordings in the present study is somewhat curious as routine BP measurement is taught in the curriculum. There is perhaps a need to emphasise the prevalence of hypertension in all adults, regardless of age, general health status and other risk factors, to ensure holistic management of patients presenting to osteopaths. This

Blood pressure (BP) measurements by age category and self-reported BP measurement within the 6 months prior to the initial consultation.

			Age Group (count)						
			15–24	25–34	35–44	45–54	55–64	65–74	75 plus
BP recorded in last 6 months	BP recorded at initial consultation	Yes	22	25	14	6	6	1	
		No	42	55	24	19	9	5	1
	BP Classification	Optimal	10	9	5	1	1		
		Normal	9	9	4	4	3		
		High-normal	2	5	5	1		1	
		Grade 1 hypertension		1			1		
		Grade 2 hypertension	1	1			1		
	BP not recorded in last 6 months	BP recorded at initial consultation	Yes	22	17	8	1	3	
No			31	56	18	4	4		
BP Classification		Optimal	6	9	3				
		Normal	11	4	2	1	3		
		High-normal	1	4	2				
		Grade 1 hypertension	4		1				

emphasis may also need to be supplemented with professional development for the clinical supervisors, to increase measurement rates in the student-led clinic.

Conclusion

The current study set out to explore the prevalence of patients with hypertension who were attending an Australian student-led osteopathy clinic. The results demonstrated a large proportion of patients attending the student osteopathy clinic were not having their BP measurement taken, and of those who were, a significant proportion were found to have readings above the *normal* classification. Routine screening of BP did not appear to be occurring in the student-led clinic in the present study and this may also be reflective of private osteopathic practice. As primary contact health professionals, osteopaths are encouraged to assess a patients' BP on a routine basis, as they are able to identify hypertension that is undiagnosed or not appropriately controlled, and possibly prevent the onset of chronic disease. This study confirms the need to learn how to measure BP within the classroom, apply this measurement within the clinical curriculum, and to ensure there are no barriers to practitioners taking BP measurements. The key to improving BP measurement rates in the student-led clinical environment, requires further clinical education and practical assistance to apply their skills and use the equipment provided in the consultation rooms.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Statement of competing interests

All other authors identify no competing interests.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ijosm.2017.11.006>.

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