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“You don’t know what you don’t know”: Knowledge, attitudes, and current practice of physiotherapists in recognising and managing metabolic syndrome, a mixed methods study

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Abstract

Objectives To determine the knowledge, attitudes, and current practice of primary care physiotherapists in recognising and managing clients with metabolic syndrome.

Design Mixed-methods research design comprising an online survey and focus groups.

Participants Australian and English physiotherapists (n = 183) working in a primary care setting responded to the survey. Twelve physiotherapists participated in focus groups.

Results Metabolic syndrome was not on physiotherapists radar. They did not screen for metabolic syndrome nor provide management for it in primary care. Although most physiotherapists had some awareness of metabolic syndrome, they were not knowledgeable. Physiotherapists reported a need to focus on their clients’ presenting condition, and there was uncertainty on whether metabolic syndrome management was within their scope of practice. Despite this, physiotherapists felt they had an important role to play in exercise and physical activity prescription for chronic disease management and were keen to further their knowledge and skills related to metabolic syndrome. Survey responses and focus group data were convergent.

Conclusion Physiotherapists working in primary care settings are well-placed to identify metabolic risk factors in their clients and provide physical activity interventions to enhance management but currently lack knowledge to embed this in clinical practice. Training and resources are required to enable physiotherapists to identify and manage metabolic syndrome within their practice.

Contribution of paper

- Primary care physiotherapists have limited knowledge about metabolic syndrome and are not currently identifying and managing it in their practice.
- Physiotherapists require education on the link between metabolic syndrome and musculoskeletal conditions, so they can promote healthy behaviours as an important component of management that may support a reduction in future chronic disease.

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Keywords: Metabolic syndrome; Physical therapy specialty; Primary health care; Health promotion

Introduction

Up to a third of the world's adult population have metabolic syndrome [1]. Metabolic syndrome diagnosis is based on an individual having at least three of five metabolic risk factors: abdominal obesity, raised blood pressure, raised triglycerides, lowered high-density lipoprotein cholesterol, and raised fasting glucose [2]. People with metabolic syndrome are twice as likely to develop cardiovascular disease and five times more likely to develop diabetes [3], with double the healthcare utilisation and costs compared to people without it [4]. It is therefore vital to intervene early and proactively manage people with metabolic syndrome before they develop chronic disease.

Lifestyle modification comprising exercise and diet is recommended as first-line management for metabolic syndrome [5]. Physiotherapists in primary care are well-placed to recognise the risk factors and provide lifestyle modification advice to address metabolic syndrome. Primary care refers to a broad range of services provided outside the hospital setting that address health promotion, as well as management of acute and chronic conditions [6]. For physiotherapists this may be in community health or private practice settings. Although primary care physiotherapy provides an opportunity to offer health promotion interventions, metabolic syndrome may be prevalent and undiagnosed. When clients presented for allied health management of primarily musculoskeletal conditions in a community rehabilitation setting, it was found 64% had metabolic syndrome yet it had only been diagnosed in 2% [7]. This suggests that opportunities to intervene proactively are being missed. The degree of awareness of metabolic syndrome and its current management within primary care physiotherapy services is currently unknown.

We aimed to determine the knowledge, attitudes, and current practice of primary care physiotherapists in recognising and managing metabolic syndrome.

Method

Design

A mixed-methods study including an electronic online survey and online focus groups. A concurrent triangulation strategy [8] collected quantitative and qualitative data. Survey results were reported consistent with the CHERRIES checklist [9,10]. For the focus groups, an interpretive description framework [11,12] was used to gain a better

understanding of the knowledge, attitudes and practices of physiotherapists regarding metabolic syndrome. Focus group results were reported consistent with the COREQ checklist [13].

Participants

Physiotherapists practicing in a primary care setting in Australia and England were invited to participate. The primary care physiotherapy settings of interest included private practice clinics and community health in Australia, and community primary care services (including first-contact practitioners), and private sector physiotherapy services in England. Participants were recruited via email invitation to the clinical networks of both La Trobe and Sheffield Hallam Universities and could volunteer to participate in either the survey, the focus group or both.

Data collection

Survey: A closed online survey to assess the knowledge, attitudes and practices of physiotherapists in relation to diabetes [14] was modified to be specific to metabolic syndrome. The modified survey consisted of 31 questions across domains of background, knowledge, attitudes and beliefs, and clinical practice (Appendix 1). The survey was open for completion from September to October 2021. All items had a non-response option, and response was enforced before progressing to the next section. Respondents were able to review and change their answers via a back button. The anonymous voluntary survey took approximately 5 minutes to complete and was pilot tested by 5 physiotherapists working in primary care settings with minor modifications made [15]. QuestionPro software [16] was used to distribute the online survey, collect responses, and send reminders in a secure manner. To increase the response rate, which averages 44% for online surveys [17], there were two survey reminders [18].

Focus groups: Focus groups with primary care physiotherapists were conducted online via Zoom [19] for up to 60 minutes each, from October to December 2021. Focus groups were semi-structured and followed a flexible question guide (Appendix 2). Question prompts were reviewed and adapted following preliminary review of survey data, prior to focus groups. A moderator (SM) was present to introduce and facilitate the discussion by asking questions and probing for deeper responses [20]. The groups were observed by an experienced researcher (CP or NT) to ensure that all participants had the opportunity to express their

views. The size of focus groups was based on pragmatic decisions due to time zone differences, and individual interviews were offered when participants were unable to attend the focus group session. The flexible interview schedule was appropriate to stimulate responses for both focus group and individual interviews. All focus groups were audio-recorded and transcribed verbatim.

Data analysis

Based on previous research of physiotherapist knowledge of physical activity guidelines [21,22], to estimate with 90% confidence that 13% of the recruited participants would know the physical activity guidelines for metabolic syndrome, the survey required a sample size of 123 for estimating the expected proportion with 5% precision [23].

Descriptive statistics were used to summarise participant demographics and survey responses. Survey responses were checked for any duplicate entries using IP addresses and demographic details. Complete and incomplete survey data were included. Chi square was performed using SPSS version 26 to determine whether there were any differences in categorical survey responses between Australian and English physiotherapists, and between physiotherapists working in the private sector versus community/public sector. Consistent with interpretative description methods, inductive thematic analysis was used to explore and categorise themes derived from the focus groups [24,25]. NVivo software was used to manage qualitative data and pseudonyms were substituted for participant names. Three researchers (SM, CP & NT) read the data line by line and independently coded transcripts. Connections and comparisons among the codes were explored to develop themes and subthemes. Data were collected and analysed simultaneously to guide further focus groups and assess for data saturation [20]. The main themes were summarised by the researchers (SM, CP & NT) and checked for accuracy by participants to ensure it was an accurate interpretation of their perceptions (member checking) [26]. Appendix 3 provides an example of theme development.

Member checking (to validate the transcripts and researchers' interpretation) were used to increase credibility [26,27]. Rich description of the participants and research methods, for transferability and dependability respectively was provided [26,27], enabling an audit trail of the methods and decisions made [11]. The results of the qualitative analysis were triangulated against results obtained from the survey to look for convergent or divergent themes [28], and multiple researchers were involved in data analysis to enhance confirmability, dependability, and credibility [26,27]. To acknowledge the influence researcher experience might have on the research process, brief summaries of the researcher's backgrounds are provided to enhance reflexivity [29]. The principal researcher (SM) was a physiotherapist working and studying at an affiliated university. The other researchers were academic physiotherapists with expertise

in qualitative research (CP, NT); and physical activity and metabolic syndrome (CP, AL, CD). Reflexivity was further augmented using a reflective journal that captured the researchers' thoughts, feelings, ideas and hypotheses generated throughout the research process, in order to uncover any biases or preconceived assumptions [11,26]. The researchers all had a research interest in metabolic syndrome and its potential impact on physiotherapy practice which may have contributed a positive bias in interpreting results.

Results

Survey

A total of 301 physiotherapists from Australia and England were invited to participate and 183 responded (183/301, 61%). Of these, one discontinued after completing the demographic section, and 13 after the knowledge section. Therefore, 169 completed the survey (92% completion rate).

The mean age of participants was 39 (SD 11) years and 58% identified as female (Table 1). The mean years of clinical experience was 17 (SD 14) years and the majority worked with clients with musculoskeletal conditions (77%).

Physiotherapists' knowledge about metabolic syndrome was poor. Almost 1 in 4 survey participants had never heard of metabolic syndrome, and fewer than 1 in 5 knew all the risk factors for metabolic syndrome, the number of risk factors required for diagnosis, and the diseases metabolic syndrome increases the risk of developing (Table 2). Fewer than half of survey participants were able to identify the physical activity recommendations for people with metabolic syndrome from a selection of options (i.e., 70, 100, 150, 180 or 210 minutes of weekly moderate-intensity physical activity) (Table 2).

Physiotherapists reported they were confident to provide physical activity education but lacked confidence to provide advice about diet and nutrition, and 2 in 5 felt specialised education is required to manage metabolic syndrome and blood sugar control (Table 3, Fig. 1).

Almost half of survey participants reported they never screened for metabolic syndrome in initial assessments (Fig. 2) and 3 in 4 did not provide metabolic syndrome advice to clients, which they attributed to lack of training, concerns about scope of practice, lack of time and perceptions of patient expectations (Table 4).

There was no significant difference in survey responses between Australian and English physiotherapists or between physiotherapists working in the private sector versus community/public sector ($p > 0.05$).

Focus groups

Twelve physiotherapists (female $n=8$) from Australia and England working in community and private practice

Table 1
Characteristics of survey respondents.

Characteristic	Participants (n = 183)
Age (yr), mean (SD)	39 (11)
Gender, n female (%)	106 (58)
Clinical experience (yr), mean (SD)	17 (14)
Current primary care practice setting, n (%)	
Private practice (AUS)	102 (56)
Private sector (ENG)	15 (8)
Community health (AUS)	37 (20)
Primary care NHS (ENG)	27 (15)
First Contact (ENG)	2 (1)
Highest qualification, n (%)	
PhD	22 (12)
Master	80 (44)
Post-graduate certificate	18 (10)
Bachelor	63 (34)
Primary patient population, n (%)	
Musculoskeletal	141 (77)
Neurological	18 (10)
Women's Health	9 (4)
Sport	8 (4)
Aged Care	4 (2)
Other (paediatrics, oncology, pain)	3 (2)
Primary patient population age, n (%)	
Adults	139 (76)
Older adults (65yr and above)	41 (22)
Paediatrics (up to 18yr)	1 (1)
All age groups	2 (1)
Proportion of work week spent in direct patient care, n (%)	
0-25%	18 (10)
26-50%	14 (8)
51-75%	35 (19)
76-100%	116 (63)
Completed further education/training related to chronic disease management, n (%)	
Yes	41 (22)
No	142 (78)

Some percentages do not sum to 100 because of rounding.

settings participated in focus group interviews, with no dropouts. The average years of clinical experience was 16 (SD 14) and the majority (75%) worked with musculoskeletal caseloads (Table 5). Three focus groups (FG) (FG1:

n = 3, FG2: n = 6, FG3: n = 2), mean duration 41 (SD 12) minutes, and one interview were conducted with no new ideas emerging in the final focus group nor interview. All participants were sent the transcripts and interpretation to review and were asked to respond if they had any additions or corrections. No participants suggested edits or additional ideas; and four explicitly confirmed accuracy. A list of themes/subthemes and supporting quotes can be found in Appendix 4.

Main theme: Metabolic syndrome is not on physiotherapists' radar

Focus group participants perceived managing metabolic syndrome was not a part of their usual practice because they did not see it written in client histories; it was not something that clients were currently being referred for; and they had not received any formal training or professional development about it.

You don't know what you don't know. Unless you actually are aware of metabolic syndrome and how it can influence the presentations in front of you, you're not going to manage it are you? (P12)

Subtheme 1: Physiotherapists had awareness but were not knowledgeable

Convergent with quantitative data, physiotherapists were not familiar with metabolic syndrome (Table 6). Despite their lack of specific knowledge about metabolic syndrome they were aware of chronic disease risk factors and their overall impact on health and burden of disease.

I know a little bit about what the risk factors are and perhaps screening for them individually, but perhaps not the syndrome itself (P4)

Awareness of the individual risk factors, if not necessarily metabolic syndrome itself, was more apparent among community health physiotherapists where chronic disease management was referred to as *bread and butter* (P9) to their daily practice. In contrast, private practice participants perceived they had a lesser role in chronic disease prevention and management.

Table 2
Survey respondents' knowledge regarding metabolic syndrome.

Knowledge	All Participants (n = 182*) n (%)	Private practice (n = 117) n (%)	Community health / public (n = 66) n (%)
Had heard of metabolic syndrome.	135 (74)	81 (69)	53 (80)
Correctly identified all 5 risk factors that contribute to metabolic syndrome.	27 (16)	18 (15)	9 (14)
Correctly identified how many risk factors are required to diagnose metabolic syndrome.	33 (19)	20 (17)	13 (20)
Correctly identified diseases that metabolic syndrome increases the risk of.	26 (15)	14 (12)	12 (18)
Correctly identified the number of minutes of weekly moderate-intensity physical activity recommended for people with metabolic syndrome.	81 (47)	50 (43)	31 (47)
Correctly identified the best type of exercise for people with metabolic syndrome.	79 (46)	43 (37)	35 (53)

* n = 1 participant did not respond beyond the demographic questions.

Table 3

Survey respondents' attitudes regarding physiotherapy scope of practice in relation to metabolic syndrome.

When working with clients in primary care, physiotherapists have a role in which of the following areas?	All Participants (n = 169) n (%)
Exercise prescription	169 (100)
Physical activity promotion	169 (100)
Weight management	131 (78)
Stress management	127 (75)
Smoking cessation	83 (49)
Diet and nutrition	80 (47)
Reducing alcohol intake	62 (37)
Blood sugar control	58 (34)

Note. The total sample for this question was n=169 due to 14 missing responses.

I guess in our practice, we probably don't have a great understanding of it or the role of it. (P7)

Focus group participants did perceive they had an important role in physical activity and exercise prescription for general health though.

We can provide very effective lifelong exercise for these people (P9)

Subtheme 2: Physiotherapists focus on the presenting condition

Metabolic syndrome was not on physiotherapists' radar as they are focused on the client's presenting condition.

We tend to gloss over people's medical history and focus on just the musculoskeletal issue (P7)

It was perceived that clients also expected their physiotherapists to focus on their presenting condition, which was convergent with the survey responses (Table 6).

If a patient comes and they've got aches, pains or problems and you're addressing that and then you pick up that they've got metabolic syndrome, especially in private

practice where they're paying for the appointment..., they might go 'hang on that's not why I'm here' (P3)

Engaging clients in health promotion was seen as challenging to incorporate into practice as the focus was on treating the presenting complaint. Client knowledge, expectations, and motivation as well as the complexity of chronic disease were all perceived barriers to management and participants felt that clients knew little about metabolic syndrome and how it related to their presenting condition.

People often feel that they will be able to tackle those things once their pain has gone (P10)

To better engage clients with metabolic syndrome management in the future, client education was seen as a priority. Involving general practitioners in metabolic syndrome diagnosis and client education was reported to be integral to being able to start this conversation with physiotherapy clients.

You know, it's not something that doctors talk to patients about; the fact that their muscle aches and pains, their sleep problems, may be linked to all the things to do with their metabolic syndrome (P12)

Because of the prioritisation of the presenting condition, time was seen as a barrier to embedding metabolic syndrome management into current physiotherapy practice.

I guess it depends on what you need to do in the time that you've got available (P10)

...maybe if I had more time I would address it (P1)

Subtheme 3: Physiotherapists are uncertain whether treating metabolic syndrome is within their scope of practice

Physiotherapists queried whether metabolic syndrome management should be on their radar and part of their scope of practice, which was convergent with survey responses (Table 6).

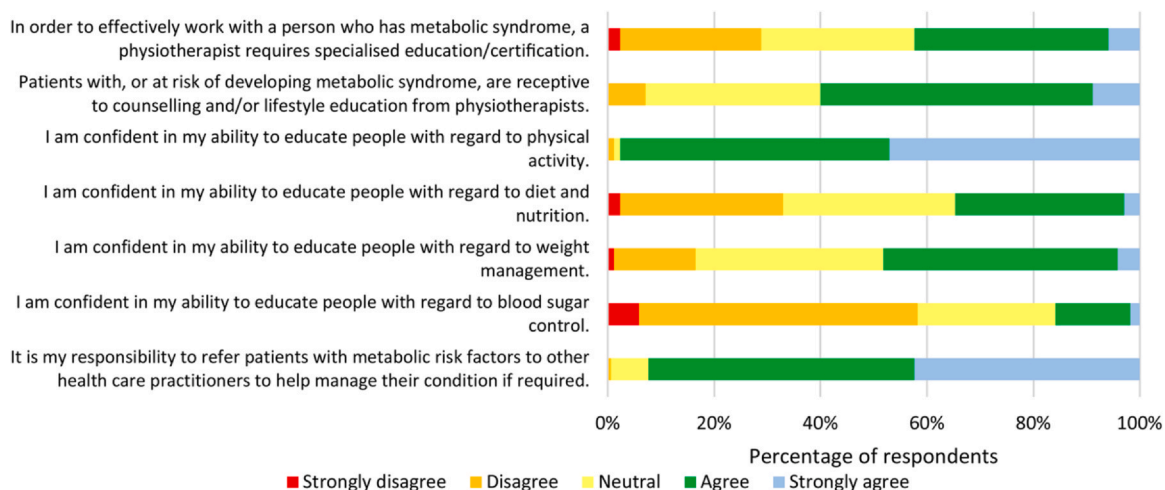


Fig. 1. Percentage of participants reporting each category of agreement with attitude statements in the survey.

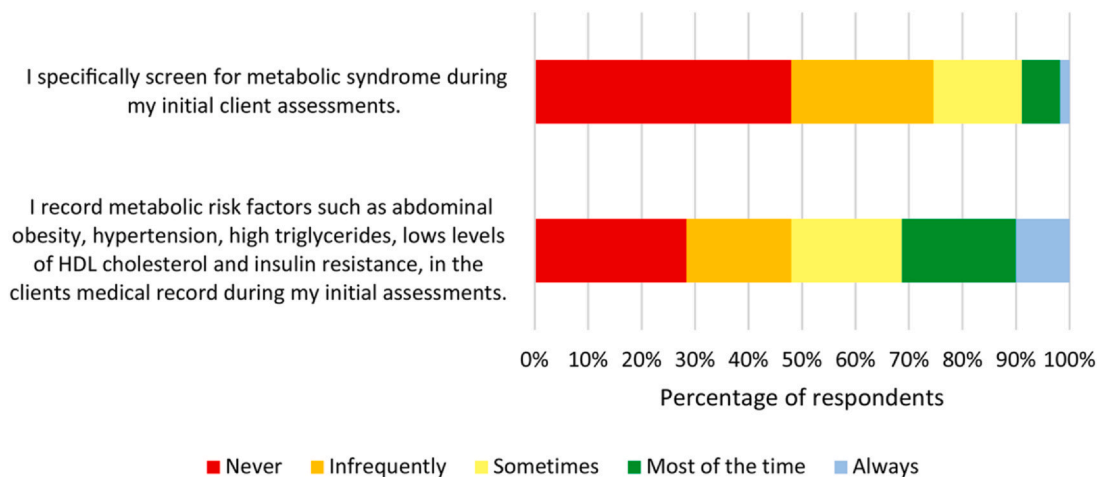


Fig. 2. Percentage of participants reporting each category of agreement with statements in the survey.

Table 4
Survey respondents' current practices in relation to metabolic syndrome.

Current practice	All Participants (n = 169) n (%)	Private practice (n = 108) n (%)	Community health / public (n = 61) n (%)
Do you offer advice to patients regarding metabolic syndrome?			
Yes	47 (28)	29 (27)	18 (30)
No	122 (72)	79 (73)	43 (70)
Reasons why not:			
Lack of training	89 (73)	58 (54)	31 (47)
I provide advice about other chronic conditions but not metabolic syndrome	60 (49)	37 (34)	23 (38)
Metabolic syndrome is outside of my scope of practice	38 (31)	28 (26)	10 (16)
Lack of time	36 (30)	24 (22)	12 (20)
Patient expectations	31 (25)	24 (22)	7 (11)
Lack of comfort	29 (24)	20 (19)	9 (15)
Lack of funding for health promotion / prevention	6 (5)	3 (< 1)	3 (1)
Other	10 (8)	4 (4)	6 (10)

Note. The total sample for this question was n=169 due to 14 missing responses.

I'd really like to know what is considered within our scope and what isn't (P1)

There was recognition that metabolic syndrome management required a multidisciplinary team approach. Community physiotherapists in focus groups reported working with other disciplines and therefore could focus on the physical activity component of management, which was within their scope of practice.

I guess in a community health setting, you are in a multi-disciplinary situation, so it often does involve working with dietitians and psychologists (P5)

Some private practitioners perceived it was outside of their scope of practice because they felt they would have to manage the whole disease and focus on things they could not manage, such as diet.

It's particularly, I know, difficult in a private practice world because we operate as silos a little bit (P3)

Some physiotherapists acknowledged the evolving role of the profession with a shift towards health promotion and managing the whole person.

We're a lot more about health promotion and trying to live a more positive, healthy lifestyle. I think that's our role every day (P7)

Other physiotherapists were just starting to recognise the importance of health promotion in their practice and the opportunity for chronic disease prevention.

I think having this knowledge would help physios help their clients to get more into preventative health (P8)

Discussion

Addressing the main aim of this study we found metabolic syndrome was not on the radar for primary care

Table 5
Characteristics of focus group participants.

Characteristic	Participants (n = 12)
Age (yr), mean (SD)	40 (15)
Gender, n female (%)	8 (67)
Clinical experience (yr), mean (SD)	16 (14)
Current primary care practice setting, n (%)	
Private practice (AUS)	5 (42)
Private sector (ENG)	1 (8)
Community health (AUS)	4 (33)
Primary care NHS (ENG)	2 (17)
Highest qualification, n (%)	
Master	7 (58)
Post-graduate certificate / diploma	3 (25)
Bachelor	2 (17)
Primary patient population, n (%)	
Musculoskeletal	9 (75)
Neurological	1 (8)
Women's Health	1 (8)
Sport	1 (8)

physiotherapists. Survey and focus group data converged finding that physiotherapists' knowledge about metabolic syndrome was poor; managing metabolic syndrome did not fit with their current mode of practice; and they were unsure about their role in health promotion for chronic disease prevention and management.

Table 6
Synthesis of findings.

Qualitative findings (Theme/sub-theme & supporting quotes)	Quantitative Findings	Convergent or divergent
Metabolic syndrome is not on physiotherapists radar. - "I'm not thinking of metabolic syndrome" (P11) - "You don't know what you don't know. Unless you actually are aware of metabolic syndrome and how it can influence the presentations in front of you, you're not going to manage it are you?" (P12)	Almost half of the physiotherapists reported they never screened for metabolic syndrome in initial assessments.	Convergent
Physiotherapists had awareness but were not knowledgeable. - "I am not so familiar with the term metabolic syndrome" (P3) - "I know a little bit about what the risk factors are and perhaps screening for them individually, but perhaps not the syndrome itself" (P4)	Almost 3 in 4 physiotherapists had heard of metabolic syndrome. Less than 1 in 5 physiotherapists could identify the risk factors for metabolic syndrome, the diagnostic criteria, and the consequent diseases. 3 in 4 reported lack of training as the reason they were not providing metabolic syndrome advice to clients.	Convergent
Physiotherapists focus on the presenting condition. - "They expect us just to fix their knee" (P1) - "We tend to gloss over people's medical history and focus on just the musculoskeletal issue" (P7)	About 3 in 4 physiotherapists were not offering any metabolic syndrome advice to clients. 1 in 4 physiotherapists do not offer metabolic syndrome advice due to patient expectations, and about 1 in 3 due to lack of time.	Convergent
Physiotherapist's unsure whether treating metabolic syndrome is within their scope practice. - "What is within our role?" (P1) - "I think a firm understanding of where we start and where someone else should begin is important." (P4)	All physiotherapists believed physical activity promotion and exercise prescription are within their scope of practice, and 3 in 4 or more considered weight and stress management as part of their role. However, almost 1 in 3 physiotherapists were not offering metabolic syndrome advice to clients as they feel metabolic syndrome is outside their scope of practice. Scope of practice concerns were greater for physiotherapists working in private practice.	Convergent

The finding that primary care physiotherapists lacked knowledge about metabolic syndrome and its management is unsurprising given that metabolic syndrome is largely under-recognised [7]. More concerning, fewer than half of physiotherapists surveyed were able to correctly identify the recommended minimum weekly amount of moderate physical activity (150 minutes) for individuals with metabolic syndrome, despite this being the amount recommended for all adults [30,31]. This is consistent with other studies that have explored physiotherapists' knowledge of physical activity guidelines [22,32]. Similar to our findings, prioritising the presenting complaint and client expectations of treatment have been shown to be barriers to physiotherapists implementing physical activity promotion in their practice in previous studies [22,33]. Furthermore physiotherapists concerns about their scope of practice when providing lifestyle interventions have also been previously voiced in regards to diabetes management [14] and addressing lifestyle-related risk factors such as smoking, poor nutrition, and excess alcohol consumption [34]. However, primary care physiotherapists did feel they had an important role to play in exercise and physical activity prescription for chronic disease management.

Primary care physiotherapists could have an important role in disease prevention. They are well placed to identify clients at risk of chronic disease and provide physical activity

interventions and lifestyle advice to lower individual metabolic risk factors [5,35] that may help to reduce future chronic disease. The ability to treat the whole person rather than focusing on the primary complaint is fundamental when applying a biopsychosocial approach to physiotherapy practice, the approach currently recommended in clinical practice guidelines for managing musculoskeletal conditions [36]. This may be particularly important for people with metabolic syndrome as one of the underlying mechanisms of metabolic syndrome, chronic low-grade inflammation [37], is also present in many musculoskeletal conditions that are commonly managed by physiotherapists [38,39]. Given the link between metabolic syndrome and musculoskeletal conditions, physiotherapists need to be aware of this so they can provide interventions that address the person's lifestyle factors as an important component of managing the presenting condition, rather than viewing health promotion as something separate. Although physiotherapists in this study reported concerns about client engagement in health promotion interventions, a recent survey found the majority of Australian adults expect a physiotherapist to provide advice to help them increase their physical activity levels and improve their general health [40]. Thus, physiotherapists should proceed confidently to provide health promotion advice as an important part of a biopsychosocial approach to client management.

Adopting a biopsychosocial approach to practice that involves changing the culture and practice of physiotherapists in this manner may be challenging. Looking at this through a socio-ecological lens [41], at an individual level this involves the individual physiotherapist addressing their current knowledge, skills and practices, along with the individual clients' expectations, knowledge and motivation. Despite greater acceptance of the relevance and importance of adopting a biopsychosocial approach amongst physiotherapists, [42] a biomedical approach to practice still dominates [43]. As such a behaviour change approach to implementing individual changes in practice may be required [44]. At an interpersonal level, support from peers and co-workers through culture shift and mentoring has been found to help facilitate change [42,45]. At organisational and policy levels, there are business and funding models that are currently in conflict with this approach [46], and from a community perspective there is lack of awareness and underdiagnosis of metabolic syndrome [7]. Although there is an important opportunity for change, there are many barriers to overcome, and knowledge translation models such as the Knowledge-to-Action framework [47], applied to address barriers at each level of the social-ecological model might help to facilitate this change.

This study had several strengths. First, the mixed methods design enabled responses from many physiotherapists (survey) and provided in-depth information (focus groups) that converged. Second, the generalisability of this study was enhanced as we sampled across two countries and multiple settings in these two healthcare

systems. Third, this study was reported according to appropriate reporting checklists, the CHERRIES [9,10] and the COREQ [13].

The study also had some limitations. The response rate may be considered low, however >60% of participants contacted responded, well exceeding average response rates for online surveys [17] and exceeding the sample size estimation of $n = 123$. The total sample of 183 physiotherapists was also larger than similar studies with unknown response rates [34,48–50]. There was smaller representation of participants from England compared to Australia, but no difference between participants responses from each country were identified. There is a risk that participant knowledge of metabolic syndrome may have been overestimated as physiotherapists who had heard of metabolic syndrome may have been more likely to respond and they may have searched for information about metabolic syndrome before or during survey participation. However, survey results were convergent with the qualitative data that participants were not knowledgeable. Despite there being a small number of focus groups and focus group participants, after no new ideas emerged in the third focus group an interview was conducted to confirm that no new ideas were emerging.

This study of primary care physiotherapists in Australia and England found they lacked knowledge of metabolic syndrome and felt that management did not fit within their current mode or scope of practice. However, they were keen for knowledge and skill development in metabolic syndrome identification, effective physiotherapy interventions, and referral pathways. Physiotherapists working in primary care settings have a key opportunity to identify metabolic risk factors in their clients and provide physical activity interventions that can prevent future disease. For this to occur, training and resources in metabolic syndrome identification and management are required.

Ethical approval: La Trobe University Human Ethics Committee (HEC21186) and Sheffield Hallam University Converis Ethics (ER34335682).

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Conflict of interest: Nil.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.physio.2024.01.008](https://doi.org/10.1016/j.physio.2024.01.008).

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