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Emergency department physiotherapists: consideration of perceived barriers and facilitators to help optimise their role in the Australian emergency department

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Abstract

Questions What are the current barriers and facilitators to the role of ED physiotherapists? How do ED physiotherapists believe their role may be optimised within the context of the ED?

Design Mixed methods study using a cross sectional survey.

Participants Australian physiotherapists currently providing services to patients within an Australian emergency department.

Intervention N/A.

Outcome measures The survey included questions related to the level of integration of ED physiotherapy into emergency department teams and wider health system, and open answer questions to identify the factors which impact and influence ED physiotherapy practice, and the future of ED physiotherapy.

Results 1 - Organisational culture, 2 - training and credentialling, 3 - governance, legislation and policies, 4 - funding, and 5 - advocacy and research were the five major themes generated from participant comments on existing facilitators and barriers to their role and the role of ED physiotherapists nationally. Six themes were generated from participant comments regarding the strategies to overcome barriers and facilitate an increased contribution by ED physiotherapists in the future: 1 - Training opportunities and specialisation pathways, 2 - Organisational culture, 3 - Governance, legislation and policies, 4 - Funding, 5 - Advocacy, 6 - Medicolegal Risks.

Conclusion Australian emergency department physiotherapists perceive their roles and emergency physiotherapy service provision to be impacted by complex and multi-factorial influences. The overall contribution of ED physiotherapy is susceptible to influence from non-linear interactions of various agents and factors which span all levels of the health system.

Trial registration N/A.

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Key Messages

What was already known on this topic

Very little was previously known regarding the perceptions of ED physiotherapists and how to increase their contribution to emergency department care. ED staff understanding of ED physiotherapy role was previously identified as the main barrier to the ED physiotherapist's role.

What this study adds

This study demonstrated and details the complex and multifactorial influences which are perceived to impact ED physiotherapists currently and into the future. This research may be used to better inform healthcare redesign and innovation to improve ED physiotherapist's ability to respond to ED workforce shortages and increased demand.

Keywords Physiotherapy, Emergency department, Emergency physiotherapist

Introduction

Appropriate staffing is crucial for an Emergency Department (ED) to provide emergency care for the community. Demand for emergency care has increased during a time when EDs have been less able to provide timely care and meet medical staffing recommendations [1–8]. To help address such issues the Australian College of Emergency Medicine (ACEM) has called for considerable and innovative healthcare system change [9]. Leveraging and increasing the contribution of ED physiotherapists, who are known to lower admission rates to hospital [10,11], facilitate shorter wait times and Length of Stay (LoS) [12–16], and result in no significant adverse patient outcomes and equivalent or lower rates of unplanned patient re-presentations compared to those seen by medical staff [12–25], is a crucial component to addressing ACEMs call for change.

Emergency department physiotherapy roles are diverse and have evolved in scope and service provision over time [26]. Secondary contact clinicians are physiotherapists who, upon a referral from a medical officer, provide discharge planning, mobility assessments, education and conservative management for a range of conditions including rib fractures, low back pain and musculoskeletal conditions for patients in the ED [27–36]. Primary contact clinicians, such as those in the United Kingdom, Canada and Australia have a more autonomous role from assessment to discharge, which can include the independent assessment of musculoskeletal and vestibular complaints, order and interpretation of imaging, and application of casts without a patient needing to see a medical officer [14–25,34,37–41]. Internationally, ED physiotherapy roles continue to evolve with the emergence of extended scope roles which require specialised training to enable physiotherapists to safely provide care outside their traditional scope [42–44].

Though physiotherapists possess the relevant skills and diverse knowledge to contribute to ED care, they are not well described in Australian ED guidelines [45]. Considering the absence of a standardised national training pathway or standardised credentialling it is unsurprising that ED stakeholders were found to lack awareness, understanding and acceptance of the ED physiotherapy role [45–54]. Kilner and Sheppard (2010) [55] identified that physiotherapists perceived this lack of awareness as the main barrier when working in an ED. However, little is known as to whether current ED physiotherapists perceive this lack of awareness to persist, or the extent to which they believe stakeholders impact ED physiotherapy contribution, service provision or growth.

Internationally, extended scope roles for allied health clinicians have been introduced rapidly to meet system demand. To their detriment this often occurred without appropriate planning, evaluation or nationally standardised training or credentialling [56,57]. How Australian ED physiotherapists believe their roles could be leveraged and evolved to support care delivery and health system performance is crucial to planning, the successful implementation of changes in ED physiotherapy service provision, and the sustainability of the role [58–60]. Despite a limited focus in the research, physiotherapists possess skills beyond musculoskeletal care, they can contribute to interprofessional teaching [61], reduce imaging and analgesia prescriptions [22], and improve ambulance offload [18]. It is therefore important to understand the perceptions of current ED physiotherapists to inform change which seeks to increase the contribution and benefits of ED physiotherapists to the health system more broadly.

Therefore, the objectives of this study were to Investigate the perceptions held by current physiotherapists to identify:

1. The current barriers and facilitators to role of ED physiotherapists.
2. How ED physiotherapists believe their role may be optimised in the context of the ED.

Method

Survey design

A cross-sectional survey was conducted using the REDCap online survey platform [62], allowing an expansive, efficient and cost-effective distribution and data collection process that encompassed a vast geographical region across Australia [62–66].

Participants

Australian Health Practitioner Regulation Agency (AHPRA) registered physiotherapists currently providing services to patients within an Australian ED were invited to participate. Physiotherapy students were excluded from the study.

Survey development

A purpose-built survey was created according to expert and literature recommendations on survey design, implementation, recruitment and reporting [63,64,67–72]. An expert consensus panel was utilised to increase relevancy and accuracy. A pilot survey utilising a convenience same of 10 physiotherapists not working in ED was used to verify understanding, accuracy and acceptability of survey questions and detect any software or access issues within the platform. The final survey, which was used in a larger study investigating the status of the ED physiotherapy workforce contained 11 closed answer and 9 open answer questions. The full survey is available in full in Appendix 1.

Procedure

Ethics approval was granted by Macquarie University Human Research Ethics Committee prior to data collection which occurred from March to July 2021. Surveys invitations were emailed through established networks, posted on various social media sites, and an article was published in the Australian Physiotherapy Association's national magazine, InMotion [73]. All invitations included a link to the survey platform and used text and images to attract attention [68,69]. Reminders were sent at four, eight and eleven weeks [67,69,70,74]. Participant consent was gained using an online participant consent and information form on the first page of the survey.

Outcome measures

The level of integration of ED physiotherapy into EDs and the wider health system

Minimum demographic data established geographical location of current workplace, length of time as a physiotherapist and length of time spent working in ED. ED physiotherapists' integration into the ED team was established, including professions with whom ED physiotherapists share close working relationships. Perceptions of the level of stakeholder understanding of the role of the ED physiotherapist and respect for this role were explored through participant ratings on a scale from 0 to 100.

Factors which impact and influence ED physiotherapy practice

Open text questions explored the perceived barriers and facilitators that impact and influence ED physiotherapists and ED physiotherapy practice locally and at a national level.

The future of ED physiotherapy

Perceptions of the potential future of ED physiotherapy practice was explored, including how ED physiotherapy might increase its contribution in the future and perceived barriers and facilitators which may inhibit or support an increased contribution.

Data analysis

Open text responses were analysed using reflexive thematic analysis [75]. A flexible approach was taken to the thematic analysis, with an inductive focus due to the need for exploration of experiences and perceptions [75]. Open text data was exported to Microsoft excel, collated, and duplicated (in accordance with ethics requirements). Two researchers (TV and LB) completed separate systematic data coding, then independently generated initial themes from the coded data. The two researchers (TV and LB) then came together to review, discuss, and further develop themes that were identified and resolve any differing interpretations. There were no instances where a consensus could not be made. Themes were then further discussed, refined, defined, and considered across the data. A third researcher (TJ) reviewed the comments, coding, and themes prior to a final refinement of the labelling and definition of themes.

Descriptive statistics were used to analyse all quantitative variables, with presentation of categorical variables given as frequency and proportion, and continuous variables as mean and standard deviation [76].

Results

One hundred and thirty individuals viewed the participant information page of the survey, 28 participants did not meet the inclusion criteria, 8 participants did not provide minimum demographic data and were not included in analysis. Ninety-four physiotherapists were included in data analysis; the survey had an overall completion rate of 83.0%, with 16 surveys were submitted with some data missing.

Participant demographics

Just over a quarter of participants had been working as a physiotherapist for over 20 years (26.6%, 25/94), with the average length of time being 17.1 years (SD 8.9).

Table 1 Participant demographical data

Categorical variable (*n*)		Percentage of participants (*n*)
Gender (*n* = 94)	Male	41.5 (39)
	Female	57.4 (54)
	Prefer not to say	< 5 (less than 5)
	Other	0 (0)
Age (*n* = 89)	25–29	9.0 (8)
	30–34	25.8 (23)
	35–39	16.9 (15)
	40–44	16.9 (15)
	45–49	12.4 (11)
	50–54	12.4 (11)
	≥ 55	6.7 (6)
Graduation Year (*n* = 94)	1970–1979	2.1 (2)
	1980–1989	5.3 (5)
	1990–1999	19.1 (18)
	2000–2009	44.7 (42)
	2010–2019	28.7 (27)
State of Work (*n* = 93)	Australian Capital Territory	3.2 (3)
	New South Wales	35.5 (33)
	Northern Territory	0 (0)
	Queensland	21.5 (20)
	South Australia	2.2 (2)
	Tasmania	3.2 (3)
	Victoria	28.0 (26)
	Western Australia	6.5 (6)
Years working in ED (*n* = 94)	5 years or less	42.6 (40)
	6 to 10 years	36.2 (34)
	11 to 15 years	16 (15)
	16 or more years	5.3 (5)
Years experience when entering ED (*n* = 93)	5 years or less	29.0 (27)
	6 to 10 years	35.5 (33)
	11 to 15 years	17.2 (16)
	16 or more years	18.3 (17)
Classification of role (*n* = 78)	Primary Contact Clinician	76.9 (60)
	Secondary Contact Clinician	21.8 (17)
	Assessment of older patients only or combination of aged care assessment team and primary contact clinician shifts	1.3 (1)

Participants were working in 37 different health district/network EDs across Australia. Over half of the participants (57.5%, 54/94) had spent more than 5 years working in ED and started working in ED within an average of 10 years (SD 6.9) of physiotherapy clinical experience (Table 1).

The level of integration of ED physiotherapy

Participants reported close working relationships with many ED MDT members as detailed in Table 2. Overall, ED stakeholders were perceived to have a good understanding (Fig. 1) and high level of respect (Fig. 2) of the ED physiotherapy role. The most commonly identified close working relationship was with ED staff specialists who were considered to have the highest level of understanding (mean 75.0, SD 18.4) and respect (mean 84.3, SD 14.7) (Figs. 1 and 2).

Table 2 Emergency Department multidisciplinary team members with whom participants (*n* = 87) identify to have close working relationships with

Multidisciplinary team member – 'roles'	Percentage of participants (*n*)
ED Staff Specialist	82.2 (72)
Nurse Practitioner	64.4 (56)
Nurse – Registered Nurse	57.7 (50)
Orthopaedic Practitioner	57.5 (50)
Medical Practitioner working in the Emergency department	57.5 (50)
Occupational Therapist	33.3 (29)
Social Worker	28.7 (25)
Emergency department Navigator	19.5 (17)
Clinical Nurse Unit Manager	18.4 (16)
Nurse – Assistant in Nursing or Enrolled Nurse	16.1 (14)
Discharge Planner	14.9 (13)
Specialist Medical Practitioner (not listed)	12.6 (11)
Paediatric Practitioner	11.5 (10)

The factors which impact ED physiotherapy - existing barriers and facilitators

Five major themes were generated from participant comments on existing facilitators and barriers to their role and the role of ED physiotherapists nationally. The majority of participant discussed one theme within each of the discrete questions: local barriers (70.0%, 42/60), national barriers (63.3%, 31/49), local facilitators (77.8%, 49/63) and national facilitators (80.0%, 20/25). The total number of participants whose comment were within each theme is displayed in Table 3.

Organisational culture

Organisational culture was identified to act as a prominent barrier and facilitator across all system levels. Participants discussed how sub-cultures within ED; comprising of the relationships between Multidisciplinary Team (MDT) members, collaboration and competition between team members, and stakeholder attitudes towards ED physiotherapists are crucial to the way the ED role was structured and perceived.

> *"I have never felt more valued as a physiotherapist than when I started working in ED. The positive response I receive from colleagues really motivates me in my role. I am really just in the beginning of my*

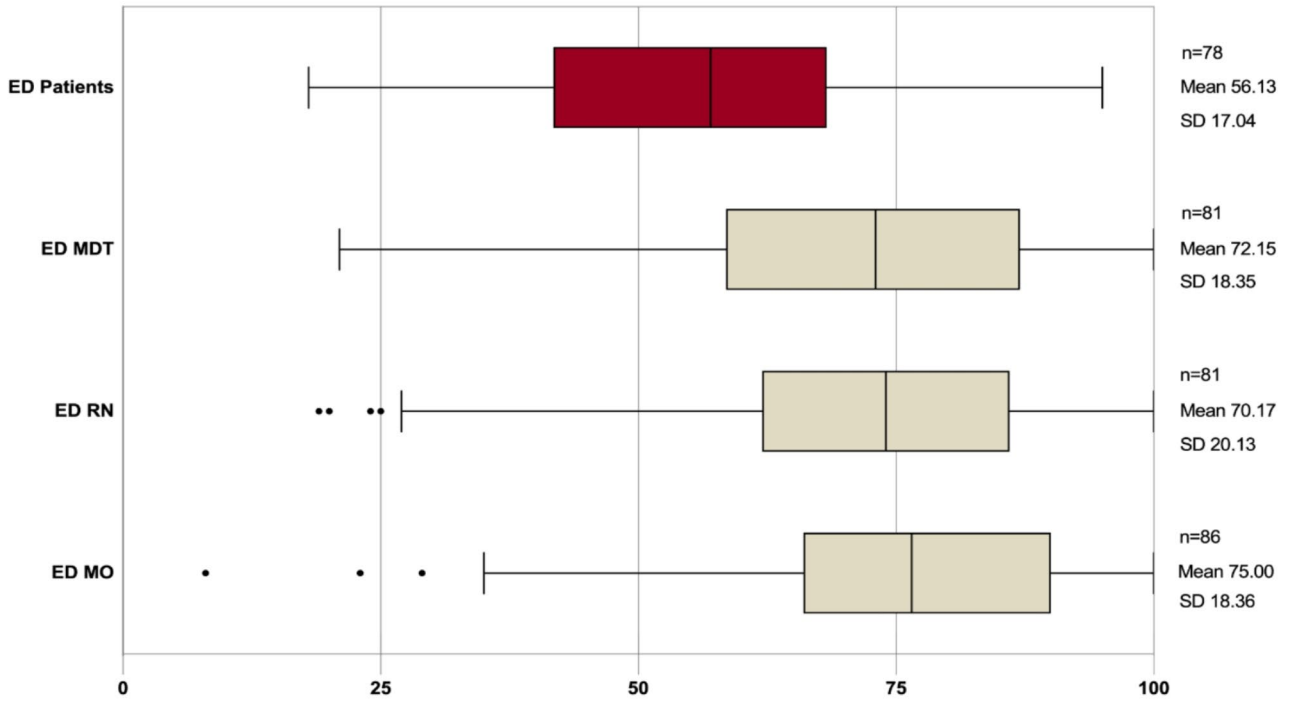

Fig. 1 Participants rating of various emergency department stakeholders' understanding of participants role on a 100-point scale (0 – extremely misunderstood, 100 – extremely well understood)

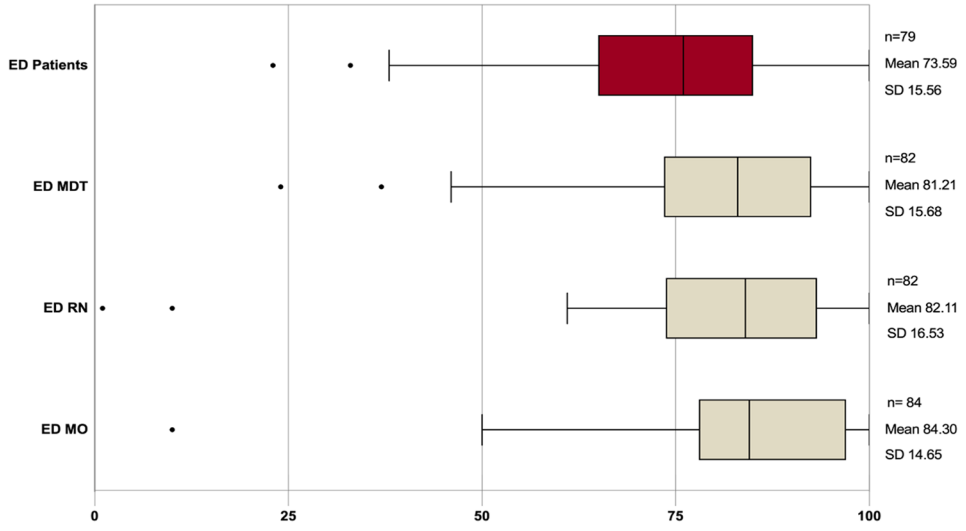

Fig. 2 Participants rating of various emergency department stakeholders' level of respect of participants role on a 100-point scale (0 – extremely disrespected, 50 – neither respected nor disrespected, 100 – extremely well respected)

ED practice, but I am very keen to progress in this clinical area. Participant 93".

Participants described supportive hospital executives and clinical managers as positively contributing to organisational culture and facilitating the role. However, attitudes of leaders that were not supportive, or did not understand or value the role were noted to negatively impact the design of the ED physiotherapy service.

"Lack of understanding of the clinical role in the ED from more senior physiotherapy positions. These senior positions make the over arching decisions locally/district and do not necessarily grasp the different demands of the ED. Having experienced senior ED physiotherapists more involved in decision making would assist in optimising the role of physiotherapy in the ED. Participant 50 ".

Table 3 Number of participants who discussed each theme within their comments on the factors which act as current barriers and facilitators at a local and national level

Theme	Barriers		Facilitators	
	Local (*n* = 60)	National (*n* = 49)	Local (*n* = 63)	National (*n* = 25)
	Percentage (*n*)			
Organisational culture	38.3 (23)	34.7 (17)	87.3 (55)	20.0 (5)
Training and credentialling	38.3 (23)	50.0 (24)	14.3 (9)	20.0 (5)
Governance, legislation, and policies	35.0 (21)	42.9 (21)	9.5 (6)	12.0 (3)
Funding	26.7 (16)	16.3 (8)	7.9 (5)	8.0 (2)
Advocacy and research	0.0 (0)	0.0 (0)	9.5 (3)	60.0 (15)

"Initial and continuing support from the executive levels within the organisation and the directors of ED. Also a very supportive head of physiotherapy over the years has helped. I think in the early phase putting the 'right' staff into ED was a big bonus as it established early confidence Participant 47.".

Participants regarded the individual and personal behaviour of ED physiotherapists as contributing positively to overall organisational culture.

'Being friendly and approachable, being willing to assist wherever necessary within my scope of practice, good clinical assessment skills in MSK and beyond... Participant 41".

Training and credentialling

Participants noted the lack of standardised training, credentialling pathways and specific ED physiotherapy development opportunities as limiting their ability to expand and more clearly define their role.

"...Lack of state-wide or nation-wide widely accepted training pathway for others to move from mid-career MSK [musculoskeletal] to specialised practice in ED Participant 78".

In contrast, some participants reported local supervision and training opportunities were available and aided their role.

"availability of training programs for extended scope prescribing and real time ultrasound that provide accreditation for a competency and secondarily having support from district level governance to allow the application of those skills. Limited ability and exposure for junior staff to learn/develop skills required to work in ED e.g. radiography interpretation, plastering, splinting Participant 48".

Advocacy and research

Advocacy was described as promoting the role of ED physiotherapists to the community and ED stakeholders, which included advocacy conducted by individuals and organisations, from local hospital and external networks, advocacy initiatives promoting ED physiotherapists by the APA and the publication of research which seeks to validate the benefits of the role.

"Research showing the benefits in patient care and LOS for ED patients seen by physios vs. traditional medical model Participant 121".

Governance, legislation, and policies

Governance structures, national legislation, and local hospital policies which provide rules and boundaries for physiotherapists, and specifically ED physiotherapists, were noted more often by participants as a barrier than a facilitator. Participants reported being frustrated by the limitations of the current scope of their role.

"Unable to independently reduce fractures. Can't inject local anaesthetic. Can't suture, can't prescribe analgesia. Can't manage wounds." [32].

Participants noted national legislation currently restricts workforce mobility and the scope of practice of ED physiotherapists including access to government schemes, such as publically funded investigations. Local hospital policies and governance structures were also discussed as factors that create hard boundaries which restrict the scope of practice of ED physiotherapists.

"Limited governance and agreement across states as to what the scope should be, and how to govern this. APA vs. APC vs. Reg board - given each state award is different, requirements are different to work across different levels e.g. Grade 3 in Vic requires post grad quals, none required in NSW" [54].

Funding

Participants noted that a lack of adequate funding resulted in a scarcity of permanent ED positions, and the apparent inability of current ED physiotherapy positions to meet ED coverage demands.

"...Funding- only limited hours available to perform role/ provide service...." [29].

In contrast, some participants reported funding to be a facilitator with these participants highlighting and

commending recent increases in funding to recruit to physiotherapists to primary contact roles.

> *"Increased budget and the prioritisation of physiotherapy services" [68].*

The future contribution of ED physiotherapists

Participants described that ED physiotherapists could increase their contribution in the future by expanding the scope of practice to increase the depth and breadth of patient management. Participants made specific note of increasing ED physiotherapist involvement in and contribution to patients presenting with dizziness, vestibular conditions, musculoskeletal conditions and age specific cohorts, namely older people and paediatrics.

> *"I think it should continue to focus on improving our current skills to improve the quality of care in EDs for elderly patients, dizzy patients and those presenting with MSK conditions." [48].*

Participants noted that ED physiotherapists could further improve ED performance measures through preventing readmissions, decreasing wait-times, reducing LoS and limiting the number of unnecessary imaging investigations. However, most were not specific on the exact mechanism by which this would occur.

> *"Increased hours, increased presence in ED, increased skills will reduce hospital admissions and reduce load on other ED staff". [79]*
> *Expand hours / shifts covered to included 24/7 physiotherapy coverage in busy EDs / where demand exists [61].*

Participants noted that ED physiotherapists could contribute to a greater provision of integrated care by improving the continuity of care for patients between the ED and broader health service.

Table 4 Number of participants who discussed each theme within their comments on facilitators to aid, and barriers to overcome emergency department physiotherapists increased contribution in the future

Theme	Enablers (*n* = 58)	Barriers (*n* = 45)
	Percentage (*n*)	
Training opportunities and specialisation pathways	55.2 (32)	11.1 (5)
Organisational culture	25.9 (15)	48.9 (22)
Governance, legislation and policies	24.1 (14)	35.6 (16)
Funding	15.5 (9)	28.9 (13)
Advocacy	20.7 (12)	0.0 (0)
Medicolegal Risks	0.0 (0)	15.6 (7)

> *"Development of pathways with community for chronic pain, aged care and respiratory patients, work with Orthopaedics for pathways for management of simple fractures" [42].*

Participants noted that there may be capacity and benefits to expand the indirect contributions of increasing the contribution ED physiotherapists make to the training and skill development of other physiotherapists and the ED MDT. The contribution of ED physiotherapists was also perceived as an important requirement in the creation of a formal and consistent national training pathway to ED physiotherapy specialisation.

> *Expanding our role so it is universal across all sites. We can be involved more in teaching reading of MSK imaging… We have a huge role in teaching MSK assessment. [47]*
> *Training of ambulance officers in early assessment of above to avoid hospitalisation. [53]*

Increased contribution of ED physiotherapists in the future: strategies to enable and barriers to overcome

Six themes were generated from participant comments regarding the strategies to enable and barriers to overcome to facilitate an increased contribution by ED physiotherapists in the future (Table 4). Participant comments were spread across themes, displaying a diversity of perceived barriers and enabling strategies.

Training opportunities and specialisation

Participants reported training opportunities, including the development of a nationally standardised training and specialisation pathway, and local mentoring and training as facilitators to ED physiotherapists being able to further contribute to the health system.

They noted the need for educational opportunities that were accessible in respect to time, financial expenditure, and the logistics of working and studying concurrently. They reported the need for a clear national benchmark of knowledge, skills,, competency and capability and noted the need for a specific ED pathway within titling and/or specialisation. However, participants did not provide a comparison or example of what specialised training would entail.

> *"Clear Standardisation & education or training schedule to benchmark Physiotherapy skillset & establish clear Physiotherapy capacity to contribute to the environment." [29].*

Organisational culture

Participants felt a change in ED stakeholder perceptions would enable an increased contribution by ED physiotherapists. They reported a need for medical and nursing staff within ED to be more accepting of changes to workload allocation practices and scope of practice, which included ED physiotherapists themselves. They also perceived the need for increased sponsorship from various levels of hospital management including physiotherapy managers, ED directors, and hospital executives as necessary to enact any change or increased contribution.

They reported a need for specific clinicians within ED to change their approach to workload allocations and scope of practice, including physiotherapists themselves. Participants reported a scarcity in suitably skilled clinicians as a barrier to increasing ED physiotherapists contribution to EDs. They questioned physiotherapists' willingness to work outside usual business hours and assume the risks associated with working in an ED. Participants reported that physiotherapists held preconceived ideas that ED is an intimidating, highly demanding, and difficult area to work in. Participants stated that these perceptions needed to be challenged and that introducing physiotherapists to the reality of working in ED in a supported and structured manner would facilitate change.

> *"Professional perception change - I have seen that Physiotherapy under-values itself and often unnecessarily boxes itself in, and the main barrier to extending scope of practice is physiotherapists themselves - managers and clinicians: "ohhh. We can't do that. That's not what physiotherapists do"." [78].*

Participants reported the competitive environment between nurse practitioners, medical officers, and physiotherapists as a barrier for the evolution of ED physiotherapy. Participants reported stakeholders' unwillingness to challenge traditional professional roles, fixed mindsets, and a lack of acceptance of new roles as barriers to increasing ED physiotherapists contribution.

> *..."some SS [Staff Specialists] are more reluctant that others to allow for extended scope practices in ED..." [68].*

They surmised that a change in focus towards a collaborative, multidisciplinary, person-centred approach to care in ED would be required to allow ED physiotherapists to take a larger, more autonomous role in ED.

Governance, legislation, and policies

Participants reported a need to pursue legislative change to allow physiotherapists' prescribing and injecting rights, alongside financial reimbursement for physiotherapy services under the Pharmaceutical Benefit Scheme. Participants reported the need to provide consistent ED physiotherapy coverage, facilitated by the introduction of policies which dictate minimum ED physiotherapy staffing across a seven-day period as a national standard.

> *"Standardised education/competency assessment Legislative change for prescribing and injecting" [10].*

They noted the reporting structure of ED physiotherapists and the discrepancy between reporting lines and funding advocacy and that ED directors, the AMA and the ACEM would continue to favour a traditional medical model in ED as opposed to advocating for increased ED physiotherapy service provision and scope.

> *Funding, perceived threats from other health professionals, legislative, incomplete understanding of potential scope of physio practice at management levels, perception of 'better bang for your bucks' if employ more doctors or NPs as they have a broader scope of practice. [49]*

Funding

Participants noted limited funding to impede ED physiotherapists increasing their contribution in the future, including a need for increased local funding to allow for teaching time within the role and to expand physiotherapy coverage hours. Participants reported a need for national funding reforms, including Medicare rebates for imaging requests ordered by physiotherapists.

> *"Medicare rebates for imaging and consults" [1].*

Participants noted a disparity in funding for allied health, including physiotherapy, compared to nursing and medical staff during planning for clinical service development, and that funding disparities would continue to be a barrier for ED physiotherapists. Some participants were not specific to the origin or distribution of any increased financial support, simply that an increase was required.

Advocacy

Participants noted the need for further advocacy for ED physiotherapists through continued publication of high-quality research, demonstrating the clinical and economic benefits of the role, from national bodies such as the APA and ACEM. Increased efforts to educate ED stakeholders, and public awareness campaigns promoting ED physiotherapy were also noted.

"Advocacy +++ of Physiotherapy roles & functions within ED. Increasing exposure of role of EDP (Emergency Department Physiotherapy) to medical world via education in conferences etc" [29].

Medicolegal risks

Medicolegal risks were felt to be a barrier to physiotherapist's willingness to increase their contribution in the future. Participants reported there being no safety net, no legally pre-defined roles, safety concerns, and questions surrounding professional indemnity as posing a substantial risk to ED physiotherapists should they increase their contribution to the ED.

"If there is no saftey net or support system to help manage the increased or perceived increase in personal risk/ liability in the Emergent environment (including appropriate training/ benchmarking) it will likely impact on the willingness of Physiotherapists to expand and actively contribute. Especially extended scope practice." [29].

Discussion

This study shows ED physiotherapists and ED physiotherapy practice to be influenced and impacted upon by a variety of human and non-human factors at an individual, local health system and national level (Fig. 3). Factors were identified in the attitudes and actions of staff, rules, regulations, and policies within ED and across all levels of the health system. Participants in the study were working in both primary and secondary contact roles and were based across almost every state in Australia. Despite the diversity in role and location, key themes emerged from across the sampled population.

At an individual level, the characteristics, skills and behaviours of ED physiotherapists correlates with existing literature which details the positive effect that capable clinicians with good communication skills, a desire to learn, and adapt to a team can have on the successful adoption and acceptance of the new roles [47–50,80]. Regardless of the level of autonomy of the physiotherapist in the role, participants in this study and existing literature, described the ability of individual clinicians to build trust, work collaboratively with other professions and clearly articulate professional roles and responsibilities to positively contribute to organisational culture, resulting in new clinicians being more readily accepted into existing teams and increasing the successful adoption of new and evolved roles. 43,[78 79],81.

Participants considered ED physiotherapists to have the capacity to more fully utilise and build upon the established benefits of ED physiotherapy to improve ED performance and care provision to a wider range of patient conditions and cohorts [12–19,22,24,39,82,83]. Enhancing the involvement of physiotherapists in the interdisciplinary care of a broader range of patients in ED including children, older adults and patients with complex or chronic conditions, could lead to improved patient outcomes, which has been found to be associated with this type of care approach [84–86]. Participants

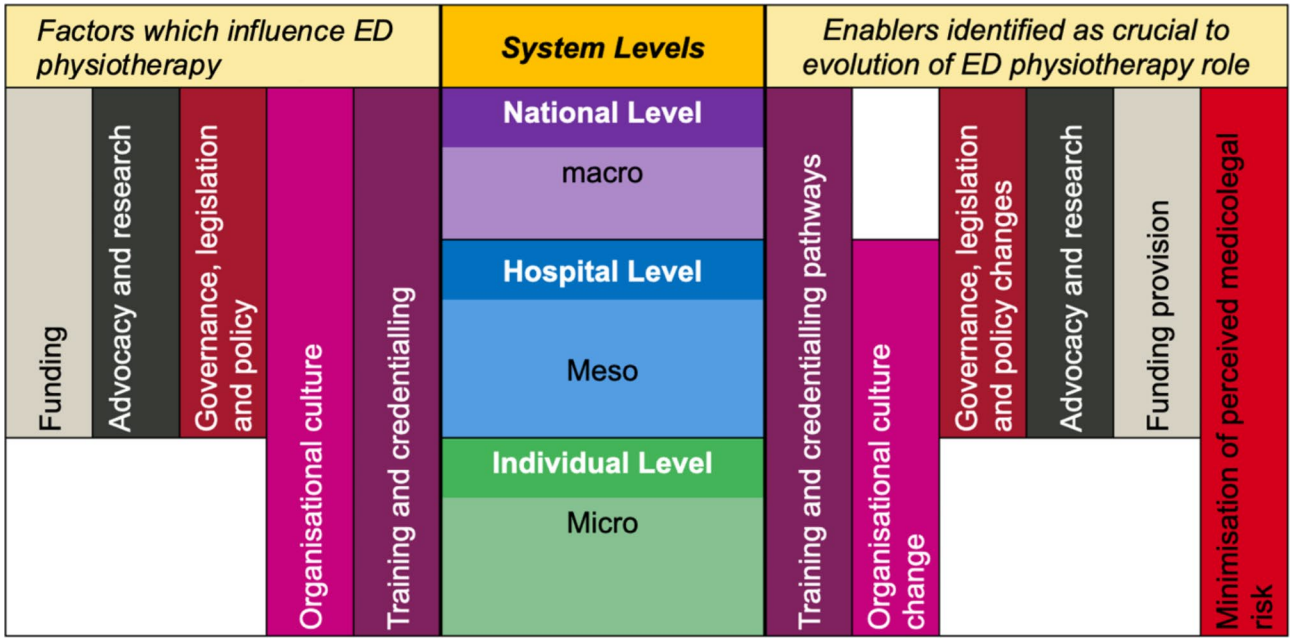

Fig. 3 Factors which influence physiotherapy and the enablers identified as crucial to the evolution of ED physiotherapy aligned with health system levels

from this study also believed ED physiotherapists to have the ability to improve the continuity of care for patients by increasing communication and collaboration between ED and clinicians working in the community. Increasing the continuity of care, ensuring appropriate referral and communication between acute hospital and community-based care settings directly aligns with integrated care principles which has been show to deliver improvements in patient experience, reduced hospitalisations and improved patient outcomes [87]. To enable increased continuity of care, ED physiotherapists would require the same access and ability as General Practitioners to enable direct referral from ED to medical specialist and for patients referred directly to community based imaging to access the same financial rebates. To support and validate the potential value of ED physiotherapists increasing their contribution, research that incorporates the broad generalist nature of both primary and secondary contact roles, includes a wider patient cohort, and evaluates the medium to long term impacts of the ED physiotherapist is required.

The absence of an ED training pathway was seen as an issue which impacts the ability to recruit appropriately skilled clinicians within local health systems, as well as being able to clearly define or expand the ED physiotherapy role. An accessible and coordinated national training pathway, with locally available supervision, has previously been identified as an important step to address the limited role clarity, workforce depth and sustainability in ED physiotherapy [16,40,48,50,51,79,88,89]. The same issue has been reported to impact extended scope physiotherapists [43,44], nurse practitioners [78,90], pharmacists [91], paramedics [77], and occupational therapist [92]. Within this study and ED physiotherapy literature more broadly the scope, focus and level of autonomy of ED physiotherapy roles varies between regions, countries and settings [26]. Despite the variation, the creation of a nationally standardised ED training and specialisation pathway have repeatedly been noted as vital in supporting the progression of ED physiotherapy, decrease the trepidation of physiotherapists commencing ED roles, and reduce the perceived medicolegal risks [54,93].

Physiotherapists, as with all registered health professionals working in Australian ED, are provided a level of legal coverage and require indemnity insurance to practice.94,] Participant responses within this study suggests further investigation is required to understand clinicians perceptions and knowledge of the legal structure and medicolegal governing policies across the breadth of their scope for both primary and secondary contact roles [94].

Local support and acceptance from ED MDT members and hospital leadership roles were highly valuable to ED physiotherapists. In this context, it was unsurprising that changes to ED physiotherapy governance structure, support from hospital leadership and managers, and accountability at a local and national level were identified as necessary to facilitate the evolution of ED physiotherapy. This finding correlates with existing literature which has recognised the need for health systems to adopt a complex systems, non-hierarchical approach to direct and indirect reporting lines [95,96], with manager and executive support crucial to enacting such changes [88,97,98].

Organisational culture was found to be a key factor influencing ED physiotherapy practice across all health system levels. Studies which have investigated factors which influence the successful adoption of inter-professional models of care, and advanced and extended scope of practice roles found similar barriers to those identified in this study. Rural health professionals, nurse practitioners, allied health clinicians and medical staff similarly reported limited resources [99–101] and funding provision [44,77,81,88,97,101], the attitudes of medical and nursing staff [78,97,99,102], and conflicting views between clinicians [99,101,102], to hinder the uptake of new roles and new models of care. Conversely, trust [47,49,103,104], clear professional roles [60,97,99], and inter-professional collaboration [47,60,88,97,103,105] enhance ED physiotherapists' contribution, positively contribute to organisational culture, facilitate inter-professional communication in emergency situations and enable the adoption of advanced practice roles.

Physiotherapy managers, ED directors, hospital executives and national bodies were all identified to contribute to organisational culture. Advocacy and public awareness campaigns promoted and supported by national bodies, such as ACEM, the Australian Medical Association and the Australian Physiotherapy Association, continue to be identified as vital to generating local support [77,80,88], challenging the existing status quo and increasing an interdisciplinary approach to care [106–108]. Furthermore, they were also identified as part of the solution to initiate the necessary increases in ED physiotherapy funding, the hours of ED physiotherapy service provision across a seven-day period, and description of physiotherapy in ED delineation guidelines. Such increases have been identified by various ED stakeholders as necessary [48,49,77,106,109,110].

Limitations

Across Australia the uptake of physiotherapy services into EDs has been noticeably varied [110]. Whilst this study has captured the perspectives of ED physiotherapists in numerous EDs and roles across Australia (excluding the Northern Territory), the exact number of physiotherapists working in Australian EDs is unknown. Estimates based on hospital data and ACEM guidelines

would infer approximately 100 to 204 full-time equivalent ED physiotherapists nationwide [53,111]. Australia has 292 public hospital EDs with 99 EDs requiring onsite access to a physiotherapist [3,45]. Therefore it can be estimated that there is at least 99 ED physiotherapists in Australia. Despite this estimation, power analysis is unable to be performed and what percentage the participants represent of the population is unknown.

This study reflects the perspectives of ED physiotherapists nationally across Australia and demonstrates that physiotherapists, despite the diversity in ED physiotherapy roles, perceive ED stakeholders to generally have a good level of understanding of the ED physiotherapy role. However, little is known regarding the perspectives of those in other health system roles, namely, Australian national bodies and legislators, hospital level executives, ED directors, physiotherapy managers, or universities. A comprehensive understanding of the factors which influence Australian ED physiotherapy contribution and evolution across all health system levels will enable a more targeted change management approach, and more accurate identification of specific individuals who may act as sponsors and agents for change within the various system levels [112].

Conclusion

This study demonstrates the complex and multi-factorial influences which impact ED physiotherapists. The overall contribution of ED physiotherapy is susceptible to influence from a complex array of interactions of various agents and factors which span all levels of the health system. These interactions and patterns do not to occur in isolation and impact ED physiotherapy in multiple ways which may not be obvious at first glance. The complexity and patterns of interaction of these agents and factors with ED physiotherapy practice, correlates with the complexity of healthcare delivery and health systems internationally [96,113–115].

Holistic research which embraces the intertwined, interconnected nature of ED physiotherapy while encompassing and establishing the diverse value of ED physiotherapy is needed. Holistic research may better inform innovative initiatives to change regulations, legislation and policies, increase role clarity and training availability and implement innovative heath system changes. Consequently, ED physiotherapy may be better positioned to respond to the anticipated ED workforce shortages and increased demand for emergency care [9,116].

Supplementary Information

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Supplementary Material 1

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Author contributions
TV, LB and TJ conceptualized the work. TV, JB and TJ critically analyzed and interpreted the results. TV drafted the manuscript. All authors subsequently revised the work. All authors approve the submitted version and agree to be responsible for their contribution.

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Data availability
The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request and in keeping with ethical requirements as granted by Macquarie University Human Research Ethics Committee to complete the research.

Declarations

Ethical approval
Ethical approval was granted by Macquarie University Human Research Ethics Committee, Reference No: 5202090921827, Project ID: 9098. The study was performed in accordance with the ethical standards laid down in the National Statement on Ethical Conduct in Human Research 2007, (updated July 2018).

Consent to participate
The first page of the survey hosted the participant information and consent form and screening questions. All participants provided written and informed consent by checking the consent box on the first page before proceeding to the survey questions.

Consent for publication
Not applicable.

Dual publication
Some portion of the results/data/figures in this manuscript have been published or are under consideration for publication elsewhere. "The publication contains material that has previously formed part of a Tina Vickery's (TV) Master of Research thesis and has been made publicly available according to the requirements of Macquarie University, the institution awarding the qualification."

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All of the material is owned by the authors and/or no permissions are required.

Competing interests
The authors declare no competing interests.

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References

1. Emergency department care. 2020–21: Australian hospital statistics Australian Institute of Health and Welfare. https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care. Accessed July 07, 2022.
2. Emergency Department Care. Australian Institute of Health Welfare Web site. https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care. Accessed July 01, 2022.

3. Australian Institute of Health and Welfare. Emergency Department Care 2019–2020 Data In. https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care2021.
4. Australian Institute of Health and Welfare (AIHW). Emergency Department care 2017–2018: Australian Hospital statistics. Health services Series no. 89, HSE 216. In. Canberra, ACT: AIHW; 2018.
5. Australian Institute of Health Welfare. Australia's hospitals at a glance. Canberra: AIHW; 2022.
6. Australian College of Emergency Medicine. State of Emergency 2022. In. acem.org.au2022.
7. Emergency department care multilevel data, Data as of June 1. 2022. Australian Institute of Health and Welfare Web site. https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care. Published 2021. Accessed July 07, 2022.
8. Australian Institute of Health and Welfare. Emergency Department Care. https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care. Accessed 3 March, 2023.
9. Doctor shortages in. emergency departments set to worsen in 2023 [press release]. acem.org.au2023.
10. van den Broek S, Westert GP, Hesselink G, Schoon Y. Effect of ED-based transitional care interventions by healthcare professionals providing transitional care in the emergency department on clinical, process and service use outcomes: a systematic review. BMJ Open. 2023;13(3):e066030.
11. Arendts G, Fitzhardinge S, Pronk K, Donaldson M, Hutton M, Nagree Y. The impact of early emergency department allied health intervention on admission rates in older people: a non-randomized clinical study. BMC Geriatr. 2012;12:8.
12. Gill SD, Stella J. Implementation and performance evaluation of an emergency department primary practitioner physiotherapy service for patients with musculoskeletal conditions. Emerg Med Australasia. 2013;25(6):558–64.
13. Guengerich M, Brock K, Cotton S, Mancuso S. Emergency department primary contact physiotherapists improve patient flow for musculoskeletal patients. Int J Therapy Rehabilitation. 2013;20(8):396–402.
14. de Gruchy A, Granger C, Gorelik A. Physical therapists as primary practitioners in the emergency department: six-month prospective practice analysis. Phys Ther. 2015;95(9):1207–16.
15. Bird S, Thompson C, Williams KE. Primary contact physiotherapy services reduce waiting and treatment times for patients presenting with musculoskeletal conditions in Australian emergency departments: an observational study. J Physiotherapy (Elsevier). 2016;62(4):209–14.
16. Goodman D, Harvey D, Cavanagh T, Nieman R. Implementation of an expanded-scope-of-practice physiotherapist role in a regional hospital emergency department. Rural Remote Health. 2018;18(2):122–8.
17. Taylor NF, Norman E, Roddy L, Tang C, Pagram A, Hearn K. Primary contact physiotherapy in emergency departments can reduce length of stay for patients with peripheral musculoskeletal injuries compared with secondary contact physiotherapy: a prospective non-randomised controlled trial. Physiotherapy (London). 2011;97(2):107–14.
18. Kinsella R, Collins T, Shaw B, et al. Management of patients brought in by ambulance to the emergency department: role of the Advanced Musculoskeletal Physiotherapist. Aust Health Rev. 2018;42(3):309–15.
19. Sayer JM, Kinsella RM, Cary BA, Burge AT, Kimmel LA, Harding P. Advanced musculoskeletal physiotherapists are effective and safe in managing patients with acute low back pain presenting to emergency departments. Aust Health Rev. 2018;42(3):321–6.
20. Ball STE, Walton K, Hawes S. Do emergency department physiotherapy practitioner's, emergency nurse practitioners and doctors investigate, treat and refer patients with closed musculoskeletal injuries differently? Emerg Med J. 2007;24(3):185–8.
21. Coombes F, Strudwick L, Bell A, Martin-Khan M, Russell T, Martin R. Evaluating the quality of primary contact physiotherapist's pain management practice for musculoskeletal patients in the emergency department. Emerg Med Australasia. 2020;32(Supplement 1):37–9.
22. Henderson J, Gallagher R, Brown P, Smith D, Tang K. Emergency department after-hours primary contact physiotherapy service reduces analgesia and orthopaedic referrals while improving treatment times. Aust Health Rev. 2020;44(3):485–92.
23. Schulz P, Prescott J, Shifman J, Jr.Fiore J, Holland A, Harding P. Comparing patient outcomes for care delivered by advanced musculoskeletal physiotherapists with other health professionals in the emergency department—A pilot study. Australasian Emerg Nurs J. 2016;19(4):198–202.
24. Alkhouri H, Maka K, Murray M, McCarthy S. The impact of the emergency physiotherapy practitioner on emergency department care for patients with musculoskeletal injuries. EMA - Emerg Med Australasia. 2020;27(SUPPL 1):1.
25. Souter B, Jones A, Sheppard L, Crowe M. Extended scope physiotherapists are effective and safe in the Emergency Department: a systematic review and Meta-analysis. Internet J Allied Health Sci Pract. 2022;20(3):7.
26. Matifat E, Méquignon M, Cunningham C, Blake C, Fennelly O, Desmeules F. Benefits of Musculoskeletal Physical Therapy in Emergency departments: a systematic review. Phys Ther. 2019;99(9):1150–66.
27. Fruth SJ, Wiley S. Physician impressions of physical therapist practice in the Emergency Department: descriptive, comparative analysis over Time. Phys Ther. 2016;96(9):1333–41.
28. Pugh A, Roper K, Magel J, et al. Dedicated emergency department physical therapy is associated with reduced imaging, opioid administration, and length of stay: a prospective observational study. PLoS ONE. 2020;15(4):e0231476.
29. Lebec MT, Kesterloot L. Physical therapist consultation in the emergency department for patients with musculoskeletal disorders: a descriptive comparison of programs in the American southwest. Int J Orthop Trauma Nurs. 2010;14(4):224–5.
30. Plummer L, Sridhar S, Beninato M, Parlman K. Physical therapist practice in the emergency department observation unit: descriptive study. Phys Ther. 2015;95(2):249–56.
31. Mo-Yee Lau P, Hung-Kay Chow D, Pope MH. Early physiotherapy intervention in an Accident and Emergency Department reduces pain and improves satisfaction for patients with acute low back pain: a randomised trial. Australian J Physiotherapy. 2008;54(4):243–9.
32. Holmes C, Hollebon D, Scranney A, Exton H. Embedding an allied health service in the Nelson Hospital Emergency Department: a retrospective report of a six month pilot project. New Z J Physiotherapy. 2016;44(1):17–25.
33. Juneja H, Platon R, Soerensen UM, Praestegaard J. The emergency physiotherapy practitioner (EPP) – a descriptive case study of development and implementation in two Danish hospitals. Eur J Physiotherapy. 2020;22(3):155–62.
34. Anaf S, Sheppard LA. Describing physiotherapy interventions in an emergency department setting: an observational pilot study. Accid Emerg Nurs. 2007;15(1):34–9.
35. Moss JE, Houghton LM, Flower CL, Moss DL, Nielsen DA, Taylor DM. A multidisciplinary Care Coordination Team improves emergency department discharge planning practice. Med J Aust. 2002;177(8):427–39.
36. Taylor DM, Bennett D, Cameron PA. A paradigm shift in the nature of care provision in emergency departments. Emerg Med J. 2004;21(6):681–4.
37. Ferguson F. Physiotherapists in ED: a city wide service supporting board performance, government targets, professional growth and most importantly patient care. Physiotherapy (United Kingdom). 2020;107(Supplement 1):e180.
38. McClellan CM, Cramp F, Powell J, Benger JR. A randomised trial comparing the clinical effectiveness of different emergency department healthcare professionals in soft tissue injury management. BMJ Open 2012;2(6).
39. Thompson C, Williams K, Morris D, et al. HWA expanded Scopes of Practice program evaluation: physiotherapists in the Emergency Department subproject:t final report. Australian Health Services Research Institute.; 2014.
40. Harding P, Prescott J, Block L, O'Flynn AM, Burge AT. Patient experience of expanded-scope-of-practice musculoskeletal physiotherapy in the emergency department: a qualitative study. Aust Health Rev. 2015;39(3):283–9.
41. Victorian Government (Department of Health and Human Services). Review of primary contact physiotherapy services final report. In. Melbourne, Victoria2010.
42. Thompson J, Yoward S, Dawson P. The role of Physiotherapy Extended Scope practitioners in Musculoskeletal care with focus on decision making and clinical outcomes: a systematic review of quantitative and qualitative research. Musculoskelet Care. 2017;15(2):91–103.
43. Wiles L, Milanese S. Stakeholder perspectives of the extended scope physiotherapy practitioner (ESPP) role in Australia – a qualitative study. Phys Therapy Reviews. 2016;21(3–6):228–35.
44. Saxon RL, Gray MA, Oprescu FI. Extended roles for allied health professionals: an updated systematic review of the evidence. J Multidiscip Healthc. 2014;7:479–88.
45. Australasian College of Emergency Medicine. Statement on the delineation of emergency departments. In:2012.
46. Sheppard LA, Anaf S, Gordon J. Patient satisfaction with physiotherapy in the emergency department. Int Emerg Nurs. 2010;18(4):196–202.

47. Lefmann SA, Sheppard LA. Perceptions of emergency department staff of the role of physiotherapists in the system: a qualitative investigation. Physiotherapy (London). 2014;100(1):86–91.
48. Ferreira GE, Traeger AC, O'Keeffe M, Maher CG. Staff and patients have mostly positive perceptions of physiotherapists working in emergency departments: a systematic review. J Physiotherapy (Elsevier). 2018;64(4):229–36.
49. Coyle J, Gill SD. Acceptance of primary practitioner physiotherapists in an emergency department: a qualitative study of interprofessional collaboration within workforce reform. J Interprof Care. 2017;31(2):226–32.
50. Barrett R, Terry L. Patients' and healthcare professionals' experiences and perceptions of physiotherapy services in the emergency department: a qualitative systematic review. Int J Emerg Med. 2018;11(1):1–1.
51. Ashley BM, Pain T, Clark H, O'Connor E, Schnierer L. A survey to Guide the Emerging Role of Allied Health Teams in a Regional Tertiary Hospital Emergency Department. Internet J Allied Health Sci Pract. 2020;18(2):1–8.
52. Anaf S, Sheppard LA. Lost in translation? How patients perceive the extended scope of physiotherapy in the emergency department. Physiotherapy (London). 2010;96(2):160–8.
53. Australasian College of Emergency Medicine. Emergency department design guidelines. In. https://acem.org.au2014.
54. Crane J, Delany C. Physiotherapists in emergency departments: responsibilities, accountability and education. Physiotherapy (London). 2013;99(2):95–100.
55. Kilner E, Sheppard L. The 'lone ranger': a descriptive study of physiotherapy practice in Australian emergency departments. Physiotherapy. 2010;96(3):248–56.
56. McPherson K, Kersten P, George S, et al. A systematic review of evidence about extended roles for allied health professionals. J Health Serv Res Policy. 2006;11(4):240–7.
57. Dawson LJ, Ghazi F. The experience of physiotherapy extended scope practitioners in orthopaedic outpatient clinics. Physiotherapy. 2004;90(4):210–6.
58. Rathert C, Williams ES, Linhart H. Evidence for the Quadruple Aim: a systematic review of the literature on Physician Burnout and Patient outcomes. Med Care. 2018;56(12):976–84.
59. Braithwaite J. Changing how we think about healthcare improvement. BMJ. 2018;361:k2014.
60. Morris J, Grimmer K, Gilmore L, et al. Principles to guide sustainable implementation of extended-scope-of-practice physiotherapy workforce redesign initiatives in Australia: stakeholder perspectives, barriers, supports, and incentives. J Multidiscip Healthc. 2014;7:249–58.
61. Geist K, Ander DS, White M, Rossi A, Johanson MA, Davis B. The physical therapist's expertise in the emergency medicine residency curriculum: an academic model for integrated health care education. J Phys Therapy Educ. 2016;30(4):17–23.
62. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377–81.
63. Hicks CM. Research methods for clinical therapists E-Book: Applied Project Design and Analysis. London, UNITED KINGDOM: Elsevier Health Sciences; 2009.
64. Kelley K, Clark B, Brown V, Sitzia J. Good practice in the conduct and reporting of survey research. Int J Qual Health Care. 2003;15(3):261–6.
65. Braun V, Clarke V, Boulton E, Davey L, McEvoy C. The online survey as a qualitative research tool. Int J Soc Res Methodol. 2021;24(6):641–54.
66. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. J Biomed Inform. 2019;95:103208.
67. Burns KE, Duffett M, Kho ME, et al. A guide for the design and conduct of self-administered surveys of clinicians. CMAJ. 2008;179(3):245–52.
68. Eysenbach G. Improving the quality of web surveys: the Checklist for reporting results of internet E-Surveys (CHERRIES). J Med Internet Res. 2004;6(3):e34–34.
69. Parsons C. Web-based surveys: best practices based on the research literature. Visitor Stud. 2007;10(1):13–33.
70. McColl E, Jacoby A, Thomas L et al. Design and use of questionnaires: a review of best practice applicable to surveys of health service staff and patients. 2001.
71. Schleyer TK, Forrest JL. Methods for the design and administration of web-based surveys. J Am Med Inform Assoc. 2000;7(4):416–25.
72. Vannette DL, Krosnick JA. A comparison of survey satisficing and mindlessness. Wiley Blackwell Handb Mindfulness. 2014;1:312.
73. Vickery T. Seeking help to get the full ED picture. InMotion,2021: 53.
74. Braithwaite D, Emery J, De Lusignan S, Sutton S. Using the internet to conduct surveys of health professionals: a valid alternative? Fam Pract. 2003;20(5):545–51.
75. Braun V, Clarke V. One size fits all? What counts as quality practice in (reflexive) thematic analysis? Qualitative Res Psychol. 2021;18(3):328–52.
76. Field A. Discovering statistics using IBM SPSS statistics. SAGE; 2018.
77. Masso M, Thompson C. Attributes of innovations and approaches to scalability–lessons from a national program to extend the scope of practice of health professionals. J Multidisciplinary Healthc. 2016;9:401.
78. Birks M, Davis J, Smithson J, Lindsay D. Enablers and barriers to registered nurses expanding their scope of practice in Australia: a cross-sectional study. Policy Politics Nurs Pract. 2019;20(3):145–52.
79. McClellan CM, Cramp F, Powell J, Benger JR. Extended scope physiotherapists in the emergency department: a literature review. Phys Therapy Reviews. 2010;15(2):106–11.
80. Matifat E, Lavoie-Côté P, Kounda N, Charrier L, Perreault K, Desmeules F. The acceptability of Physiotherapy Care in Emergency departments: an Exploratory Survey of Emergency Department Physicians. J Res Interprofessional Pract Educ. 2021;11(1):1–19.
81. Montano AR, Cornell PY, Gravenstein S. Barriers and facilitators to interprofessional collaborative practice for community-dwelling older adults: an integrative review. J Clin Nurs. 2021.
82. Sutton M, Govier A, Prince S, Morphett M. Primary-contact physiotherapists manage a minor trauma caseload in the emergency department without misdiagnoses or adverse events: an observational study. J Physiotherapy (Elsevier). 2015;61(2):77–80.
83. Strudwick K, Martin R, Bell A, Martin-Khan M, Russell T, Coombes F. Quality of care provided by primary contact physiotherapists for musculoskeletal patients in the ED. Emerg Med Australasia. 2020;32(Supplement 1):46–8.
84. Lloyd M, Luscombe A, Grant C, et al. Specialised vestibular physiotherapy in the emergency department: a pilot safety and feasibility study. Emerg Med Australasia. 2020;32(5):860–3.
85. Cassarino M, Robinson K, Quinn R, et al. Impact of early assessment and intervention by teams involving health and social care professionals in the emergency department: a systematic review. PLoS ONE. 2019;14(7):e0220709.
86. Cassarino M, Robinson K, Trépel D, et al. Impact of assessment and intervention by a health and social care professional team in the emergency department on the quality, safety, and clinical effectiveness of care for older adults: a randomised controlled trial. PLoS Med. 2021;18(7):e1003711.
87. Amelung V, Stein V, Goodwin N, Balicer R, Nolte E, Suter E. Handbook integrated care. Springer; 2021.
88. Ip K, Lloyd M, Luscombe A, Hitch D. Implementing specialized vestibular physiotherapy in an emergency department: A process evaluation. 2021.
89. Lefmann SA, Crane JL. Establishing the diverse value of the emergency department physiotherapist. J Physiotherapy (Elsevier). 2016;62(1):1–3.
90. Thompson W, McNamara M. Revealing how language builds the identity of the advanced nurse practitioner. J Clin Nurs 2021.
91. Taylor S, Cairns A, Glass B. Health professional perspectives of expanded practice in rural community pharmacy in Australia. Int J Pharm Pract. 2020;28(5):458–65.
92. Rapolthy-Beck A, Fleming J, Turpin M. Occupational therapy service provision in adult intensive care units in Australia: a survey of workload practices, interventions and barriers. Aust Occup Ther J. 2022.
93. Ferreira GE, Traeger AC, Maher CG. Review article: a scoping review of physiotherapists in the adult emergency department. Emerg Med Australasia. 2019;31(1):43–57.
94. Girard M-A. Interprofessional collaborative practice and law: a reflective analysis of 14 regulation structures. J Res Interprofessional Pract Educ 2019;9(2).
95. Greenfield D, Braithwaite J, Pawsey M, Johnson B, Robinson M. Distributed leadership to mobilise capacity for accreditation research. J Health Organ Manag 2009.
96. Braithwaite J, Churruca K, Ellis LA et al. Complexity science in healthcare. *Sydney: Australian Institute of Health Innovation, Macquarie University.* 2017.
97. Shaw BR, Heywood SE, Page CJ, et al. Advanced musculoskeletal physiotherapy: barriers and enablers to multi-site implementation. Musculoskelet Care. 2018;16(4):440–9.
98. Le-Dao H, Chauhan A, Walpola R, et al. Managing complex healthcare change: a qualitative exploration of current practice in New South Wales, Australia. J Healthc Leadersh. 2020;12:143.

99. Wei H, Horns P, Sears SF, Huang K, Smith CM, Wei TL. A systematic meta-review of systematic reviews about interprofessional collaboration: facilitators, barriers, and outcomes. J Interprof Care 2022:1–15.
100. Kilner E, Sheppard LA. The role of teamwork and communication in the emergency department: a systematic review. Int Emerg Nurs. 2010;18(3):127–37.
101. Taylor SM, Culic A, Harris S, Senini R, Stephenson R, Glass BD. Bridging Allied Health Professional roles to improve patient outcomes in rural and remote Australia: a descriptive qualitative study. J Multidisciplinary Healthc. 2022;15:541–51.
102. Li J, Westbrook J, Callen J, Georgiou A, Braithwaite J. The impact of nurse practitioners on care delivery in the emergency department: a multiple perspectives qualitative study. BMC Health Serv Res. 2013;13(1):1–8.
103. Redshaw S, Ingham V, Loftus S. Emergency decision making: an exploration of tensions between communities of practice. Int J Emergency Manage. 2015;11(1):62–75.
104. Anderson BJ, Carroll ME, Taylor SE, Chow A. Perceptions of hospital pharmacists and pharmacy technicians towards expanding roles for hospital pharmacy technicians: a cross-sectional survey. J Pharm Pract Res. 2021;51(3):216–24.
105. Nic Giolla Easpaig B, Tran Y, Winata T, et al. The complexities, coordination, culture and capacities that characterise the delivery of oncology services in the common areas of ambulatory settings. BMC Health Serv Res. 2022;22(1):1–15.
106. Janes TL, Rees J-L, Zupan B. Is interprofessional education a valued contributor to interprofessional practice and collaboration within allied health in Australia and New Zealand: a scoping review. J Interprof Care 2022:1–11.
107. Noblet T, Marriott J, Graham-Clarke E, Rushton A. Barriers to and facilitators of independent non-medical prescribing in clinical practice: a mixed-methods systematic review. J Physiotherapy. 2017;63(4):221–34.
108. Young G, Hulcombe J, Hurwood A, Nancarrow S. The Queensland Health Ministerial Taskforce on health practitioners' expanded scope of practice: consultation findings. Aust Health Rev. 2015;39(3):249–54.
109. Davidson SR, Bolsewicz K, Kamper SJ, et al. Perspectives of emergency department clinicians on the challenges of addressing low back pain in the emergency setting: a qualitative study. Emerg Med Australasia. 2022;34(2):199–208.
110. Maka K, Alkhouri H, Wong L, George L, Walton A, McCarthy S. Identifying the activities of physiotherapy practitioners through primary and secondary models of care provided in New South Wales emergency departments. Australasian Emerg Care. 2022;25(1):30–6.
111. Australian Institute of Health and Welfare. Australian hospital peer groups. Health servies series no.66 cat no. HSE 170. In. Canberra, Australia: AIHW; 2015.
112. Braithwaite J, Churruca K, Long JC, Ellis LA, Herkes J. When complexity science meets implementation science: a theoretical and empirical analysis of systems change. BMC Med. 2018;16(1):1–14.
113. Carroll A. Integrated Care through the Lens of a Complex Adaptive System. In: Amelung V, Stein V, Suter E, Goodwin N, Nolte E, Balicer R, editors. Handbook Integrated Care. Cham: Springer International Publishing; 2021. pp. 595–609.
114. Plsek PE, Greenhalgh T. The challenge of complexity in health care. BMJ. 2001;323(7313):625–8.
115. Pype P, Mertens F, Helewaut F, Krystallidou D. Healthcare teams as complex adaptive systems: understanding team behaviour through team members' perception of interpersonal interaction. BMC Health Serv Res. 2018;18(1):1–13.
116. Cornish S, Klim S, Kelly A-M. Is COVID-19 the straw that broke the back of the emergency nursing workforce? Emerg Med Australasia. 2021;33(6):1095–9.

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