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'I'm Not Sure Who to Refer You to': Experiences of Clinicians Accessing Allied Health for Their Patients With Parkinson's Disease

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ABSTRACT

Rationale: Allied health interventions have been shown to improve impairments and quality of life in people with Parkinson's disease (PwPD). However, globally allied health is underutilised, and referrals tend to be reactive and occur in moderate to advanced disease. Currently little is known about the referral patterns of PwPD to allied health in Australia.

Aims: This study examined the allied health referral patterns of neurologists, general practice physicians (GP) and Parkinson's disease nurse specialists (PDNS) treating PwPD in New South Wales (NSW), Australia.

Methods: Four neurologists, three GPs and four PDNSs each completed a demographic questionnaire and a semi-structured interview. Interview data were analysed using inductive thematic analysis.

Results: All clinicians experienced difficulties locating approachable, available, affordable, and appropriate allied health services. Clinicians also perceived that patient ability to interact impacted their involvement in allied health therapies. Referrals were typically made in response to symptom progression. The most common individual disciplines referred to were physiotherapy and/or exercise physiology, followed by speech pathology and occupational therapy. Multidisciplinary teams (MDT) were generally not available, so referrals to MDTs occurred less frequently.

Conclusion: Clearer guidelines regarding when to refer to individual allied health disciplines and to MDTs are needed to facilitate more proactive referrals by clinicians treating PwPD. Establishing an MDT model for PwPD throughout Australia would improve the approachability, availability and appropriateness barriers, and could improve quality of life for PwPD.

1 | Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disorder affecting > 8.5 million people worldwide [1]. People with PD (PwPD) present with a variety of motor (e.g., bradykinesia, rigidity, tremor) and non-motor impairments (e.g., mood disorders, cognitive impairment, communication difficulties) that play a significant role in reducing quality of life [2–6]. As

medications do not slow progression or fully control PD impairments, nonpharmacological interventions such as those delivered by allied health professionals should be considered [2, 4, 5, 7, 8]. Allied health interventions for PwPD can improve impairments, mobility, balance, strength, speech, swallowing, activities of daily living, and quality of life, as well as reduce falls [2, 3, 9–17]. For people with early-stage PD, exercise-based interventions can possibly delay disease progression [11].

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Allied health referrals are often to physiotherapy (PT), occupational therapy (OT), or speech pathology (SP) [18–21]. Evidence suggests that multidisciplinary teams (MDT) which also incorporate social work (SW), psychology and dietetics may be more beneficial than referral to individual allied health disciplines [22–25]. Despite the growing body of evidence supporting early referral to allied health including MDTs [2, 20, 22, 23, 26–29], allied health services appear underutilised [21, 26, 30]. Referrals tend to be made reactively in response to factors such as recent falls, functional difficulties, advancing disease, hospital admissions, older age and caregiver strain [21, 31]. This is problematic given the evidence informing allied health practice has come from studies of people with mild to moderate PD [20, 32]. Lack of awareness by physicians of the benefits of allied health intervention, lack of adequate time to screen for referral need and other systemic barriers may also contribute to under referral [19, 21, 26, 30, 32].

In Australia, the healthcare system is made up of public and private services (Figure 1). Outpatient allied health services are predominantly accessed privately, by fee for service or private health insurance [33, 34]. Allied health can also be accessed through public funding schemes, primarily

Medicare subsidised but also other funding schemes should they be eligible [35–39].

PwPD are often managed by a neurologist and/or primary care physician [6, 18, 40], termed a general practitioner (GP), in Australia. They may additionally have a PD nurse specialist (PDNS) [6, 41] involved who coordinates their care in the community. Both physicians and PDNSs are involved in referring PwPD to allied health. However, currently little is known about how these clinicians manage PwPD, their referral patterns and any triggers or barriers to referral.

To understand the factors influencing the underutilisation of outpatient allied health, this study aimed to examine referral patterns by neurologists, GPs and PDNSs treating PwPD in New South Wales (NSW), Australia. The specific research questions were:

1. How do neurologists, GPs and PDNSs manage PwPD, and what is their focus of management?
2. What triggers allied health referral/s?
3. What are the factors that influence the referral patterns of neurologists, GPs and PDNSs to allied health?

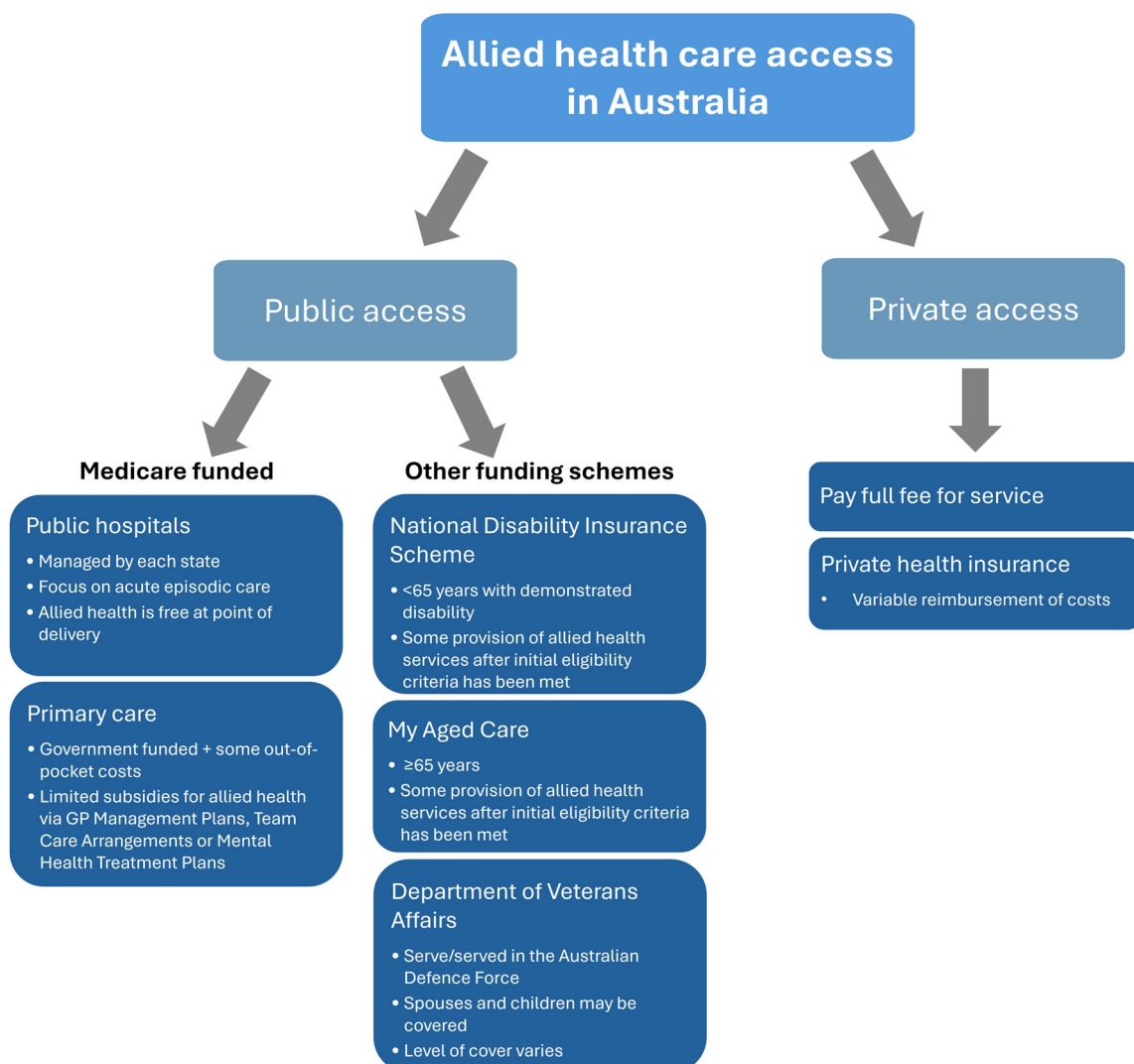


FIGURE 1 | Outpatient allied health access pathways in Australia.

2 | Methods

In this qualitative study, participants were recruited between November 2022 and August 2023. Advertisements for the study were distributed through Parkinson's NSW; nursing, GP and neurology networks; and the researchers' medical networks. Participants were included if they practiced as a neurologist, GP or PDNS in NSW, Australia's most populous state [42], and had experience managing at least 10 PwPD in total and at least two within the last year. Purposive sampling was utilised to ensure a mix of professions practicing in metropolitan and regional areas.

This study was approved by The University of Sydney Human Research Ethics Committee (2022/668).

2.1 | Data Collection

Participants completed a demographic questionnaire which captured profession, years of practice, locations of work [43], number of PwPD seen annually, and if PwPD are seen publicly and/or privately. One semi-structured interview was conducted with each participant via phone call, Teams (Microsoft Corporation, Washington USA) or Zoom (Zoom Video Communications Inc., California USA). Interview prompts probed management plans for PwPD, when clinicians consider allied health referral, to which disciplines they refer and any barriers to referral (see Supporting Information S1). Interviews were conducted by one researcher (CW), a female physiotherapist with clinical experience in PD, and training in qualitative methods, who had no prior relationship with any participant. Participants were aware of the interviewer's qualifications. Interviews were audio recorded then transcribed verbatim by the interviewer. Field notes were written during and immediately following each interview. The interviewer debriefed with another researcher (SP or SD) after each interview. Prompts in the interview schedule were adjusted as required, the purposive sampling reviewed to identify gaps in the sample and data discussed to determine if there was saturation. Interviews concluded once the researchers were satisfied that data saturation had occurred. Six participants consented to member checking and their transcripts were returned to them, but no edits were made.

2.2 | Data Analysis

Demographic data were summarised to describe the sample. Deidentified transcripts were coded openly and inductively by one researcher (CW) who familiarised herself with the data before commencing line by line coding informed by the Braun and Clarke method of thematic analysis [44] with NVivo v14 (QSR International P/L). The research team, comprising female researchers with expertise in PD, qualitative methods and health services, regularly conducted coding meetings to discuss and refine codes.

As coding progressed, it became apparent that codes focusing on allied health access closely matched the Levesque model of healthcare access [45] (Figure 2), so the coding frame was

updated to incorporate this model. The model describes both dimensions of service accessibility (supply determinants) and patient ability to interact with services (demand determinants), and how these dimensions interact. The supply-side determinants [45] utilised in this study are approachability, availability and accommodation, affordability and appropriateness. Approachability refers to how easy it is to identify that a service exists, can be reached and be impactful. The availability and accommodation of health services encompasses whether the service exists, and if so whether it has the capacity to deliver services and can be physically and promptly reached. Affordability refers to the economic ability of people to pay for services, both monetarily and in time. Appropriateness of a service relates to whether a service fits a person's needs, with timeliness and quality of the service playing a role.

The demand-side determinants [45] include ability to perceive, seek, reach, pay and engage in care. Ability to perceive the need for care is influenced by a person's health literacy, knowledge, and beliefs. Ability to seek is based on personal autonomy, capacity to choose, knowledge of healthcare options and their rights. Ability to reach describes whether a person can physically reach healthcare services and is dependent on their personal mobility, available transportation, and knowledge of services. Ability to pay refers to a person's capacity to pay for health services through the generation of economic resources. Ability to engage in healthcare relates to a person's participation and involvement in decision-making and treatment and is influenced by their capacity and motivation levels. Cultural and social acceptability of PwPD accessing allied health was not raised by clinicians as a concern during the interviews so data were not coded to this Levesque domain.

3 | Results

Thirteen clinicians responded to the advertisements and 12 consented to participate. One was excluded as they did not practice as either a physician or nurse. The 11 interviewed participants included four neurologists (two Movement Disorder Specialists), three GPs and four PDNSs (Table 1). Interview time ranged from 13 to 34 min.

3.1 | Management

Management plans focused on education and medications. All clinicians reported providing education to PwPD at diagnosis and throughout the disease. Neurologists and GPs focused on medication initiation and titration, whilst PDNSs provided education regarding medication and monitored effects. GPs reported they were the primary physician managing some of their patients with PD as these patients had not seen a neurologist or did not see one regularly.

Clinicians included referrals to outpatient allied health as part of their management plan, but referral pathways varied depending on profession. Neurologists reported referring directly or requested the patient's GP or rehabilitation specialist to make an allied health referral. Although neurologists could request referrals to allied health via PDNSs, this pathway was only

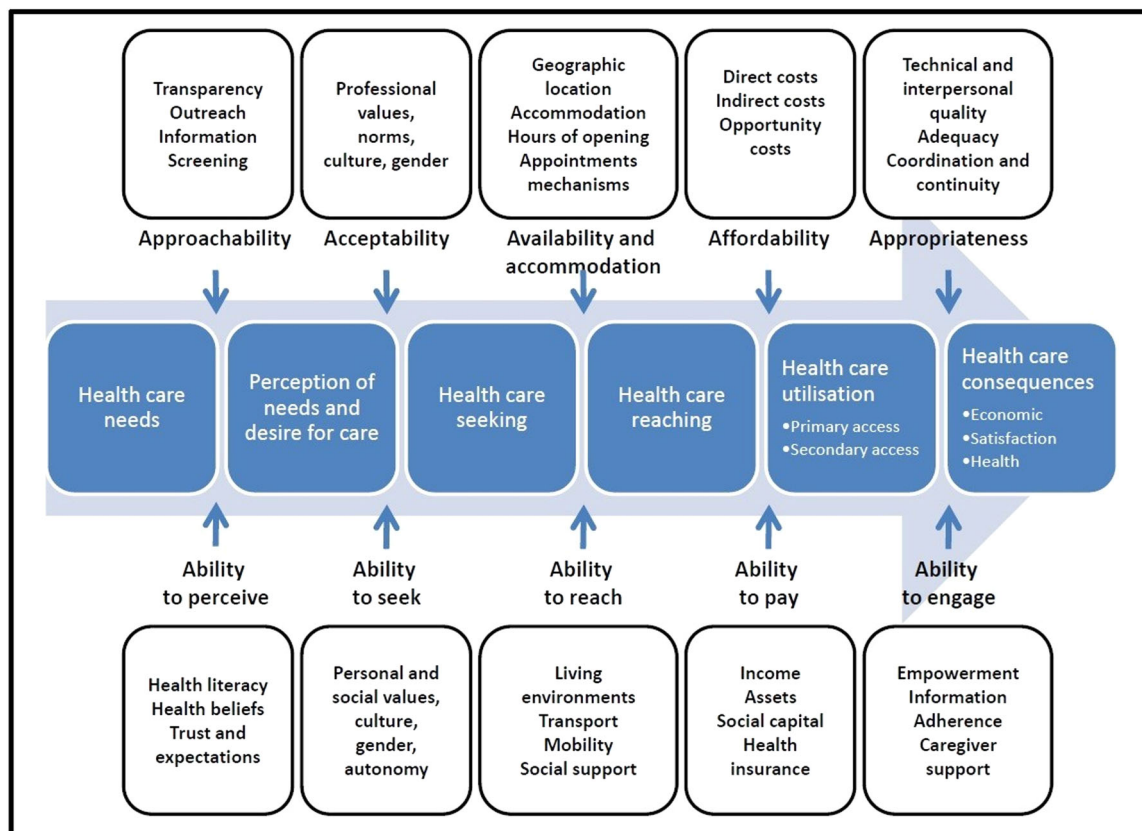


FIGURE 2 | A conceptual framework of access to health care. This figure is reprinted from the International Journal for Equity in Health, 12, J. F. Levesque, M. F. Harris, G. Russell, Patient-centred access to health care: conceptualising access at the interface of health systems and populations, 18, Copyright 2013 [45].

TABLE 1 | Characteristics of the 11 study participants.^a

Characteristic	Neurologists <i>n</i> = 4	General practitioners <i>n</i> = 3	PD nurse specialists <i>n</i> = 4
Sex, male, <i>n</i> (%)	4 (100)	3 (100)	1 (25)
Time spent practicing in specialty (years)	2–30	8–25	1.5–15
Number of PD patients seen per year	50–500	3–10 ^b	70–150
Clinicians see patients as, <i>n</i> (%)			
Public	0 (0)	0 (0)	4 (100) ^c
Private	3 (75)	1 (33.3)	0 (0)
Public and private	1 (25)	2 (66.7)	0 (0)
Practice location ^d , <i>n</i> (%)			
Major cities	4 (100)	2 (66.7)	4 (100)
Inner regional	2 (50)	2 (66.7)	4 (100)
Outer regional	0 (0)	0 (0)	2 (50)

^aData reported as *n* (%) or range.

^b1 General Practitioner indicated they have 0–5 patients with PD at any one time point, thus the rounded average of 3 was taken.

^cAll PD nurse specialists in this study were funded by Parkinson's NSW and/or the NSW state government.

^dPractice location was classified using the Australian Statistical Geography Standard Remoteness Areas Structure 2021 [43].

reported by PDNSs. GPs utilised GP management plans or mental health treatment plans to refer to allied health at reduced cost to the patient. PDNSs commonly referred to allied health directly but would liaise with the GP if a management plan would benefit the patient financially. They also liaised with National Disability Insurance Scheme (NDIS) or My Aged Care

coordinators to arrange allied health services through funded packages when the patient was eligible. Additionally, PDNSs provided care coordination, ensuring that PwPD were linked in with supportive resources and networks locally. As such, they screened PwPD for symptoms and/or risk factors that would trigger the need for allied health referral.

3.2 | Triggers for Referral

There were inconsistencies in referral patterns to allied health between and within clinicians, with referrals occurring predominantly in response to symptom progression. All clinicians reported referring PwPD to PT and/or exercise physiology (EP), with most referrals occurring reactively in response to balance impairments, bradykinesia, dystonia, falls or mobility issues. Musculoskeletal injuries or respiratory impairments would result in a PT rather than EP referral. Few clinicians reported referring to PT and/or EP in early-mid stage disease to assist PwPD to establish exercise programmes; PDNSs were most likely to refer for this reason. The next most common disciplines that clinicians referred to were SP and OT, then dietetics, psychology and counselling. The timing of referral to SP was predominantly in later stage disease, in response to speech or swallowing impairments. However, PDNSs described they would refer some PwPD to SP earlier for swallowing assessments before marked impairments. Referrals to OT, dietetics, psychology and counselling occurred in response to symptom progression, with triggers including the need for home modifications for safety, malnutrition risk or being overweight, and psychological distress, respectively. Only one clinician, a PDNS, reported referring to SW whilst physicians described a lack of SW access outside of the hospital system.

3.3 | Themes: Factors Influencing Referrals

Five main themes were identified that aligned with the Levesque model of access: approachability; availability and accommodation; affordability and ability to pay; appropriateness of allied health services; and perceptions of patient's ability to access [45]. The first four themes predominantly relate to supply-side determinants. Affordability and ability to pay were combined in this study given it was difficult to differentiate between affordability and the clinician's perception of a patient's ability to pay. The perceptions of a patient's ability to access theme combines the remaining demand-side dimensions of a patient's ability to interact with services. Given this study interviewed clinicians and not PwPD, this theme incorporates how clinicians perceived their patient's ability to interact with healthcare services.

3.3.1 | Approachability

All clinicians in this study wanted to refer to allied health and were aware of potential triggers for referral to each allied health discipline, including at different disease stages. However, clinicians experienced challenges in relation to the approachability of allied health service providers.

GPs and PDNSs tended to work in similar geographical areas to where their patients lived, so were more aware of local allied health services. PwPD often travelled to see neurologists and therefore neurologists had difficulty identifying appropriate allied health practices local to the patient.

I tend to rely on Google a lot. Sometimes when the patient's in with me. So, unless someone pops up

immediately in that area I mean, I wouldn't know where to look...

(Neuro-2)

GPs reported on-site allied health services were easier to refer to and communicate with, but outside of this were sometimes unsure of available practices locally. They reported utilising networking to build links to locally available and appropriate allied health practices over time.

So, my previous workplace, the OT and the EPs were actually on site [...] So those two, I did refer [...] But if I was working in a mainstream general practice where those things were not available and they were not aged care appropriate then I'm not sure how much referral I would have done.

(GP-3)

I suppose in the way that you sort of get a sense of who's [allied health] in the area after a while [...] or they're people I have just come to know through informal networks.

(GP-1)

PDNSs were the most linked in with local allied health practices in the area and reported that often neurologists approached them to refer patients to allied health.

70% of our patients are travelling out of [regional] area[s] to [metropolitan areas] to see, fly in, fly out neurologists. And those neurologists don't necessarily know what is available in their area. So, they often will just ask in their letter that this be arranged.

(PDNS-1)

In terms of approachability when utilising a funding scheme, GPs and one neurologist reported difficulties navigating the NDIS system, including lack of clarity about eligibility criteria and the administrative burden involved to support applications.

NDIS it's all a big headache... They say, oh, you need to do a letter for these people [...] [there's] no time to do all things. So, I think what I tend to do is to go oh you know, Parkinson's NSW, someone from NDIS and you can work with them and then effectively if you need a letter to confirm your diagnosis, I'm your doctor, that's fine.

(Neuro-3)

It's not a medical programme, NDIS... It's like disability support and their social welfare programmes have nothing to do with health and medicine. So, their criteria is foreign to us.

(GP-2)

Similarly, one GP reported difficulty in organising My Aged Care providers and a lack of communication between themselves and providers.

some patients... could access... additional allied health through home care package [...] But I don't know, strangely, whenever I try to access it then you end up having to talk to the ca[se]... manager and then things don't really happen... the communication between me and them [...] I was never happy with that relationship.

(GP-3)

3.3.2 | Availability and Accommodation

Clinicians reported a lack of availability of allied health services, particularly in the public system and in regional areas. A lack of adequate staffing contributed to insufficient service availability and long waitlists in the public system.

so patients I see in the public system... will usually have to seek allied health services outside of the public system. Because, you know, the services are already so stretched [...] Private system, I mean there's so many options for people. As long as cost isn't an issue then you can access pretty quickly physiotherapy services.

(Neuro-2)

I feel like a city... they've got lots of resources. I just wish it was like even spread [...] staffing these services have been really challenging. So, we have a referral pathway but we'll soon find out that especially private, they move on so frequently.

(PDNS-2)

Service availability was further limited when clinicians attempted to refer their patients to MDTs. PDNSs were more aware of MDT options that were local to the patient. However, in regional areas, changing availability of MDT providers presented challenges. PDNSs and a neurologist also described that even when they located an appropriate MDT, not all disciplines may be available.

So, in [regional] area, we have... an MDT team that do sort of rehabilitation. So... there's an OT, a physio, a speech pathologist and a social worker. Unfortunately, because in the regional areas they sort of staffing these positions can be quite difficult. And so there's always one discipline that's not there.

(PDNS-2)

Clinicians reported that when an appropriate PD service was available, sometimes eligibility criteria, such as needing to reside within a specific geographical area, excluded PwPD from accessing the service. Additionally, clinicians highlighted that

when there was a lack of local services, the option of telehealth was not always feasible for older PwPD. Regional PwPD would sometimes have to travel to metropolitan areas to access available and appropriate allied health. For PwPD living close to interstate borders, access was further complicated by having to navigate another state's healthcare system.

so even out at [regional town] when I've tried to refer people... with significant swallowing difficulties, they tried so hard to get in to see someone. So, I ended up getting a referral for someone in [metropolitan area] and they did a nice swift review of the patient and then followed them up with telehealth.

(PDNS-3)

3.3.3 | Affordability and Ability to Pay

Clinicians reported that costs of allied health services played a significant role in preventing PwPD from accessing allied health care or affording ongoing care. Although GP management plans and mental health care plans could assist PwPD in accessing more affordable allied health, there were insufficient sessions for PwPD to access the care they needed.

when we're talking about like GP management plan and Team Care arrangement... many patients who are older often already use the full 5, usually podiatry [...] So, once you do that, then there's no more management plan rebates.

(GP-3)

Due to the lack of affordability of private services, many clinicians referred PwPD to public services, however then availability becomes a problem.

we can send them to the hospital outpatient services [if they cannot afford private allied health]. It just takes a bit of time to sometimes link them in.

(GP-1)

PDNSs often organised allied health services through a My Aged Care package or the NDIS if eligible, to reduce the cost burden.

If they're under the NDIS or My Aged Care, I will contact their coordinator for their package... and say, "who do I need to refer them to?" So, it's usually a private allied health professional and they can help me facilitate that so that it's all still included under the package, so that the person's not out-of-pocket.

(PDNS-4)

Due to high healthcare costs and limited ability to pay, clinicians described how patients would not go ahead with appointments despite recommendations.

So, I refer people and the speech path people, they're great. They'll go to your home. It's a mobile service. Yeah, the problem is it's so expensive. It's hundreds of dollars per visit and they do a great job, but they [the patients] don't want to pay. So, they cancel... Once they hear the price, they won't have it.

(Neuro-4)

3.3.4 | Appropriateness

Neurologists and GPs reported a lack of, or difficulty locating, neurologically or PD trained allied health clinicians, whilst PDNSs were better linked in with appropriately trained clinicians.

speech pathology is a good example. We've just kind of written a list of everyone we know who is around. And I try to limit that list to everyone we know who is around that has LSVT or speak out training.

(PDNS-1)

The other issue is that many patients tell me that many of allied health, for instance, physiotherapists may be sports oriented or actually injury oriented and... it's not like they are particularly have a special interest in aged care... So, they don't feel that they're getting good experience. So, finding the right sort of allied health can be challenging in the private system.

(GP-3)

Neurologists said that a database of allied health clinicians specialised in treating PD or neurological disorders would be helpful.

it would be useful to have some kind of... database of practitioners who are interested in treating movement disorders [...] it would be helpful to know whether there are particular practitioners who are... interested in that area.

(Neuro-2)

Clinicians also expressed dissatisfaction with the inability to choose an allied health provider, especially a PD trained allied health provider, when accessing care through My Aged Care.

Then when it comes to the private system... if we can get them into a home care package, it depends what provider is available. I certainly can provide a list of people that have experience with Parkinson's, but it really comes down to providers, and in a regional area that's been, there's been a shortage as well.

(PDNS-2)

3.3.5 | Perceptions of Patient's Ability to Access

Clinicians' perceptions of patient's ability to access allied health care combines the four remaining demand-side determinants of ability to perceive, seek, reach and engage [45].

A patient's ability to perceive, seek and engage all impacted their involvement with allied health interventions. Patients' health literacy, knowledge and beliefs all contributed to how willing they were to engage in allied health therapies. Neurologists and GPs described how some PwPD viewed taking medication as easier or superior to allied health interventions, impacting their decision to start allied health therapies, motivation to participate and level of involvement in ongoing therapy. Due to patient autonomy and capacity to choose, physicians reported that although they counselled these patients on the benefits of allied health, not all patients would engage.

Patients will take a tablet that don't want to exercise, but they'll do that because it's easiest. It's time consuming... you got an hour with the physiotherapist. It might take you an hour and a half to get there, an hour and half to get back. You've lost half your day for an hour of therapy.

(Neuro-3)

the medical dogma seems to place primacy on generally on pills, unfortunately. And you know so much our job is always just trying to counsel patients in general of the utility of... a holistic appraisal of the situation and... nonpharmacological therapy and the importance of the allied health disciplines [...] some patients I find have their own intrinsic biases or prejudices against exercise and you know, nutrition or other lifestyle education [...] I find it's still difficult to get all of them over the line on it.

(GP-1)

Lack of transport or issues with personal mobility were described by GPs and PDNSs as limiting what allied health services PwPD could access. This ability to reach healthcare deteriorates as the disease progresses.

we can talk to them about increasing taxis, subsidies and transport support and things like that. So, getting to places is hard, particularly as the disease progresses.

(GP-2)

4 | Discussion

This study is the first to explore the allied health referral patterns of neurologists, GPs and PDNSs treating PwPD in Australia, including their management priorities, triggers for and barriers to referral. Referrals were predominantly reactive and triggered in response to symptom progression. Significant

barriers to referral were encountered as described by the Levesque model of healthcare access [45].

All clinicians included education, medication and consideration of allied health referral in their management plans for PwPD, with PDNSs additionally performing care coordination. The care coordination role of PDNSs was facilitated by longer appointment durations compared to GPs and neurologists. PDNSs were funded by Parkinson's NSW and/or the state government, meaning that PwPD did not have to pay for appointments. The longer appointments, the focus on care coordination and their increased awareness of local allied health providers places PDNSs in the unique position of having the time to screen for and consider the need for allied health referral, which has and continues to be a barrier to referral, particularly for physicians [19, 32].

The allied health disciplines which clinicians most commonly referred PwPD to were PT (and/or EP), SP and OT, consistent with previous international studies [19, 21, 30, 47, 48]. Clinicians referred to psychology and dietetics less frequently, which may be due to the absence of symptoms requiring referral, or may reflect the lack of availability of both individual providers and integrated care models for PwPD [49]. Allied health referrals were mostly reactive and triggered by symptom progression, in contrast to the NICE guidelines for PD [27] which advises referral to PT, OT, SP in the early stages of PD, and referral to dietetics without specifying timelines. Some clinicians, predominantly PDNSs, reported making earlier referrals to PT and/or EP, which may be due to their awareness of the large evidence base supporting physiotherapy and exercise interventions for PwPD [6, 50–52], particularly as an early intervention. Given that PwPD in early-stage disease can have impairments in cognition, speech, gait, balance and activities of daily living [2, 14, 53, 54], delays in referral to allied health may result in suboptimal care [21].

The reactive nature of allied health referrals may be due to a focus on medication as the primary management strategy for PD, rather than considering medication in conjunction with allied health. A lack of physician recognition regarding early disability and the benefits of allied health interventions during early disease stages [19, 26, 32] may also delay allied health referrals, particularly for GPs who may not read PD specific journals or guidelines [30]. Inconsistencies in recommendations, such as highlighting that EP, PT and OT management are important in early-stage PD but encouraging PwPD to be self-sufficient with an exercise programme [6], may further contribute. Clearer recommendations about when to encourage self-management and when to initiate a referral for specific allied health disciplines are needed to ensure proactive referrals can be made.

In Australia, the healthcare system tends to respond reactively as a whole, with a focus on treating acute conditions rather than on prevention [55, 56]. Only 1.3% of total health expenditure was dedicated to prevention, lower than the expenditure in other western countries such as United Kingdom and USA [57]. A government report on chronic conditions found that patients experienced uncoordinated and fragmented care, difficulties finding approachable and appropriate services, as well as affordability, transport and mobility issues [58], highlighting

the difficulties people with chronic conditions encounter when attempting to access appropriate care.

Clinicians in this study all wanted to refer to allied health and discussed attempts at early referral. However, they were hindered by a lack of awareness of approachable, available, affordable or appropriate allied health services, with perceptions of patient's abilities also impacting access. The difficulty locating approachable allied health professionals with appropriate training was highlighted by American neurologists, who requested an identified network of allied health professionals who had PD expertise [59], matching our neurologists' requests for such a database. Lack of availability of allied health services, particularly in regional areas, is well known [47, 60, 61]. Another Australian study [47] found that 80% of PwPD in metropolitan areas accessed allied health compared to only 62% in regional areas. Globally, PwPD residing in regional areas also experienced the burden of travelling long distances to access healthcare and long waitlists, with transport and personal mobility limitations further complicating access, particularly as the disease progressed [60–62].

Accessing affordable healthcare services is one of the most significant barriers experienced by PwPD and the cost burden increases as the disease progresses [60, 63–65]. A lack of affordable allied health providers was a barrier to PwPD accessing care or accessing enough care. This affordability issue has been similarly reported in relation to general healthcare access, with Australians either not seeking or delaying GP treatment and not taking prescribed medications due to co-payment and out-of-pocket costs [57]. An Australian study [64] reported substantial out-of-pocket healthcare costs for PwPD. The cost burden of medications and specialist appointments is ten times higher than the relatively small cost of allied health [64]. Similarly, an American study noted that for advanced PD, outpatient medical costs (including medications) were six times more than home health services comprising nursing and allied health [65]. Given that allied health interventions are cost effective and contribute to reduced overall healthcare costs [66, 67], improved access to affordable allied health care would lead to improved patient outcomes while reducing healthcare costs.

Clinicians' perceptions of a patient's ability to perceive, seek, reach and engage with health care all influenced the extent to which they perceived their patients would participate with allied health interventions. It has been hypothesised that PwPD may choose not to engage with allied health if they deem the time, cost and travel burden as outweighing the potential benefits gained [30]. In our study, clinicians noted that patient perceptions such as medications being superior to allied health, as well as mobility or transport limitations, affected PwPD's desire to seek or access allied health care.

The lack of availability of and referral to MDT is similar between Australia and internationally [21]. Although single discipline referral rates ranged from 15.3% to 66.7%, multi-disciplinary referral rates were < 10% [21]. Overall, higher rates of MDT referral were observed at expert care centres and with the inclusion of countries such as the Netherlands which has ParkinsonNet [68], a national network of PD trained clinicians. Differences in affordability and regional access were thought to

impact referral rates, as described in our study. Given the evidence for MDTs and their role in improving quality of life and function [2, 21–23, 26, 27], clinicians treating PwPD should consider a multidisciplinary referral rather than simply referrals to single disciplines.

The implementation of an MDT model such as ParkinsonNet could improve care quality, health outcomes and costs [66, 67, 69], however, this model would need to be adapted to account for the geographical spread of the Australian population. Establishing an MDT model for PD in Australia could be based on successful, existing Australian models such as the MDT cancer care model which provides a timely, integrated and coordinated approach to care from time of diagnosis for all patients [46, 70]. A key component of the cancer care model is the availability of databases that enable searches by cancer type, specialty, geographical location and preferred language to locate specialists who are members of an MDT [71]. Implementation of such a database for PwPD within Australia would enable early and regular MDT access and remove the barriers of approachability and appropriateness. Telemedicine could be utilised in areas where there are no appropriately trained allied health providers to link local therapists with clinical specialists, improving service delivery and building local workforce capacity. Principles from the MDT rehabilitation recommendations [29] could be utilised to ensure all allied health disciplines provide proactive and consistent care from diagnosis. Additionally, intensive bouts of tailored interventions could be provided when deterioration in PwPD is noted [26]. To ensure that all PwPD receive comprehensive and coordinated care, every patient should have their own care coordinator. In Australia, we see PDNSs in regional areas fulfilling this role, elsewhere GPs and practice nurses may be best placed to do this as part of a shared care model with neurologists. Although MDT referral is recommended from diagnosis by expert consensus [29], further research evidence and guidelines supporting MDTs would better enable implementation of MDT care in clinical practice.

A limitation of this study is that all GPs and neurologists interviewed were male. However, it is not expected that patterns of referral by physicians to allied health would be linked to the clinician's sex. The findings from this study are specific to the Australian healthcare system, particularly NSW, as this is where all clinicians practiced. The sample of GPs interviewed were noted to have a particular interest in aged care, chronic conditions or PD, therefore their referral practices may not be reflective of all GPs.

In summary, we found that neurologists, GPs and PDNSs predominantly referred to individual allied health disciplines, with MDT referrals occurring less frequently. Factors hindering referral to allied health were identified across both supply-side and demand-side determinants of the Levesque model [45]. The implementation of an MDT model based on ParkinsonNet and successful cancer care models in Australia could enable early and regular MDT access, potentially improving quality of life and function in PwPD.

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Ethics Statement

This study was approved by The University of Sydney Human Research Ethics Committee (2022/668).

Consent

All participants provided oral or written informed consent before data collection.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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