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An observational study of Australian private practice physiotherapy consultations to explore the prescription of self-management strategies.

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Abstract

Objective: To explore the types of self-management strategies prescribed; the number of strategies and length of time allocated to self-management prescription, overall, by consultation type and by injury location, in physiotherapy consultations.

Methods: Cross-sectional, observational study of 113 physiotherapist-patient consultations was undertaken. Regression analyses were used to determine whether consultation type and injury location were associated with the number of strategies prescribed and length/fraction of time spent on self-management.

Results: 108 patients (96%) were prescribed at least one self-management strategy; commonly exercise and advice. Mean length of time spent on self-management was 5.80 minutes. Common injury locations were neck (n=40) and lower back (n=39). No statistically significant associations were observed between consultation type or injury location for either outcome (number of strategies and the length/fraction of time allocated to self-management prescription).

Conclusion: Physiotherapists regularly spend time prescribing self-management strategies such as exercise, advice, the use of heat or ice, to patients receiving treatment linked to a range of injury locations; suggesting that self-management is considered an important adjunct to in-clinic physiotherapy.

Practice Implications: Clinicians should reflect on how self-management strategies can be used to maximise patient outcomes; and whether the allocation of consultation time to self-management is likely to optimise patient adherence to each strategy.

Key words: Self-management, Physiotherapy, Consultation Time, Adherence

Introduction

The main goal of physiotherapy is to restore (or maintain) optimal physical functioning and therefore, physiotherapists routinely treat patients with a wide range of injuries (1). In many countries, physiotherapy is delivered in both public and private health care settings. In Canada, 42% of physiotherapists work in private practice (2) and approximately 25% of UK physiotherapists work outside of the National Health Service (3). In Australia, private physiotherapy practices are in operation in over 5000 locations nationally, with approximately 53.5% of registered physiotherapists working in the private sector (4). In Australia, it has been estimated that physiotherapists working in private practice deliver an average of 796 consultations per physiotherapist annually (4). The median number of physiotherapy consultations per patient has been reported as 15; with the largest number of days between consultations being 5.4 days (5). This consultation frequency places physiotherapists in an ideal position to initiate and follow-up with patients about their role in injury self-management.

Self-management refers to any strategy that is specifically intended for the patient to complete independently to manage their condition (6, 7). Self-management strategies maybe considered an important adjunct to in-clinic care because patients will spend more time away from the therapists than receiving 'hands-on' treatment (8). There is high quality evidence that home based self-management strategies can be as effective as physiotherapist-provided therapy (9). Key clinical findings from a systematic review reported that equal gains can be made from either a home program or expert-provided therapy for improving function and strength following anterior cruciate ligament reconstruction; improving symptom management for patients with knee osteoarthritis; improving exercise adherence for obese patients; and improving exercise tolerance in patients with rheumatoid arthritis (9). In addition, there is evidence that home programs may lead to improved treatment outcomes for patients following arthroscopic knee surgery, and patients with patellofemoral pain syndrome (9).

Despite evidence suggesting the effectiveness of self-management strategies for a range of injuries (9, 10), to the authors' knowledge, there is limited research about self-management prescription in physiotherapy. A national survey of Irish

physiotherapists, practising in both the public and private health sectors, reported that advice and exercise were the most frequently provided treatments for chronic low back pain (11). The frequent use of advice and exercise is supported by a survey of Indian physiotherapists (12). However, neither of these two studies differentiated between treatment strategies which were provided by physiotherapists during clinic time and those intended as self-management (11, 12). Results of these studies are limited, however, as they relied on physiotherapist self-report (11, 12), rather than more objective methods, such as observation. Understanding which types of self-management strategies are prescribed can provide an indication of the extent to which physiotherapists are incorporating self-management within their overall treatment plan.

Physiotherapists and other rehabilitation professionals play an important role in health promotion, injury prevention and rehabilitation (13). Despite this, there are currently no published studies regarding the amount of consultation time physiotherapists in out-patient settings spend on prescribing patient self-management strategies, and the types and numbers of strategies prescribed during this time. The amount of consultation time that physiotherapists devote to self-management could provide an indicator as to the relative importance placed upon self-management. These data could also provide a benchmark regarding the time private practitioners spend on self-management prescription; leading clinicians and researchers to develop strategies as to how best this time can be utilised to encourage patient participation and adherence.

Objectives

In order to broaden knowledge about physiotherapist-patient communication in Australian private practice, the objectives of this observational study were to explore, in physiotherapy consultations, the:

1) Types of self-management strategies prescribed,

2) Number of self-management strategies prescribed (overall, by consultation type and by injury location) and;

3) Length of time allocated to self-management strategy prescription (overall, by consultation type and by injury location).

Methods

Study Design:

A cross-sectional, observational study of physiotherapist-patient consultations was utilised to provide a more robust data collection methodology than relying on physiotherapist's self-reported behaviour. It was undertaken and reported in guidance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (14). Ethics approval for this research project was granted through the University of Newcastle (Australia) Human Research Ethics Committee.

Setting and participants:

Physiotherapists working in private practice within 50km of two large cities within Australia were located via Australian Physiotherapy Association 'find a physio' web-link (available at: http://www.physiotherapy.asn.au/apawcm/controls/findaphysio.aspx.). Physiotherapists were sent an invitation e-mail to participate in this study with an attached 'Participant Information Statement'. Eligibility criteria included only physiotherapists who worked in private practice and saw a general case mix of patients. Study participation required written consent from both private physiotherapy practice owners as well as individual physiotherapists.

Patient participants comprised of a consecutive sample of patients attending for either an initial or follow up consultation (regardless of injury location or condition) with an eligible physiotherapist at a consenting practice. Patient inclusion criteria included those aged 18 years and older who were physically, mentally and possessed sufficient understanding of English to be able to give informed consent.

Eligible patients were identified by the practice receptionist at the time of their attendance for their physiotherapy consultation. Patients were then approached by the researcher (a physiotherapist with 18 years of clinical experience including seven years in private practice) to discuss participation in the study. Patients were given written information about the study prior to giving informed consent.

Data collection:

Data were collected between May and October 2015.

Physiotherapist Demographics: Physiotherapists were asked to complete a demographic survey which included characteristics such as gender, location of practice, country in which they obtained their physiotherapy qualification and post-graduate qualifications.

Observational data collected during physiotherapist- patient consultations: The research physiotherapist observed up to 10 physiotherapist-patient consultations for each participating physiotherapist. The number of observed consultations was limited to 10 patients per physiotherapist to reduce the burden of study participation for each physiotherapist. A coding checklist and guideline for the observation component of this study was developed specifically for this study by a team of experienced researchers for use during the physiotherapist-patient consultations. During the observed consultations the research physiotherapist recorded the number and type of self-management strategy prescribed in each consultation; the total consultation time (calculated to the nearest whole minute from the recorded start and finish time of each consultation); and the amount of time spent prescribing self-management strategies as per the coding checklist (recorded to the nearest whole minute using a digital watch). See Appendix 1.3. For this study, self-management strategies were defined as "any strategy that the physiotherapist prescribed to the patient specifically for them to complete independently, away from the clinic". This is consistent with the definition used in previous studies (6, 7, 15, 16). Examples included independent exercises; recommendations to use a heat pack; giving the patient a brace to wear. Advice was recorded only when it related to a specific activity or action which the physiotherapist requested the patient to complete, such as advice 'I want you to get up and walk around after sitting for 60 minutes whilst at work'. If the advice was non-specific or conversational this was not recorded, such as 'maybe a sit-stand desk would help, we can discuss this next time'. Two mock clinical vignettes were used to pilot test the observation checklist by the study's research physiotherapist and a second experienced physiotherapist. Inter-rater reliability was substantial (Kappa = 0.92)(17). In an attempt to minimise reactivity (i.e. change in patient and/or physiotherapist behaviour due to being observed), the coding checklist was not

accessible to patients or physiotherapists prior to study completion. Therefore, although patients and physiotherapists were made aware prior to giving consent that their consultation was to be observed, neither were informed of which specific aspects of the consultation was of interest to the researcher.

Patient sociodemographic and treatment characteristics: The following data were obtained from the treating physiotherapist for each consenting patient: age, gender, injury location, whether the consultation was an initial or follow-up and number of previous physiotherapy consultations.

Data analysis:

Data analysis was conducted using the statistical software package, Stata® 14 (USA). Descriptive statistics (proportions means and/or medians) were calculated for participant characteristics, number and types of self-management strategies prescribed and duration and types of consultation. For each consultation, the total consultation time and total time spent on self-management strategies was documented. These data were then used to calculate the mean percentage of the total consultation time spent on self-management strategies as well as the mean time spent per strategy. The median is reported as well as the mean where data distributions were skewed (18).

Multivariable regression analyses were performed to assess associations between factors. Poisson regression was used to explore was associations between number of prescribed self-management strategies (dependent variable) and the independent variables: type of consultation (initial or follow-up) and injury location (due to small numbers of some injury locations, injury locations were combined into three categories: lower limb; spine, and upper limb), total consultation time was accounted for as an offset in the model. Over-dispersion of the data was assessed by inspecting the residual deviance divided by the degrees of freedom. When exploring associations between time spent prescribing self-management strategies as a fraction of the total consultation time (dependent variable) and type of consultation (initial or follow-up) and injury location (independent variables) a Gamma regression analysis (with a log link) was used. Parameter estimates from this model when exponentiated reflect a multiplicative difference in the outcome. Statistical significance was set at $p=0.05$ for all analyses.

Results:

Participants:

A total of 14 physiotherapists from four private physiotherapy practices in two large cities within Australia were recruited, of whom eight (57%) were female. Twelve (86%) physiotherapists obtained their physiotherapy qualification in Australia and two (14%) had a post-graduate physiotherapy qualification. The mean number of hours worked per week was 34.

The total number of patients screened for eligibility was 119, of which 114 patients were eligible (insufficient English to be able to give consent n=1; younger than 18 years n=4). Of these, 113 consented to participate; consent rate 99% (mean number of eight patients per physiotherapist). Patient participant characteristics are summarised in Table 1. All 113 patients attended for physiotherapy treatment of a musculoskeletal condition. With regard to the location of patient injury, 73% of patients (n=82) attended for physiotherapy of spinal origin (Table 1.1).

Table 1.1. Sociodemographic and injury characteristics of patient participants (n = 113)

Patient Characteristic	***Mean; Median; Range***
Age	52; 50; 25-95 (years)
Number of previous physiotherapy consultations	10; 5; 0-130
	Frequency (%)
Gender:	
• **Female**	77 (68%)
• **Male**	36 (32%)
Attendance for initial consultation	19 (17%)
Location of injury:	
Lower limb	
• **Ankle**	3 (3%)
• **Knee**	14 (12%)
• **Hip**	4 (4%)
Spine	
• **Lower back**	39 (34%)
• **Upper back**	3 (3%)
• **Neck**	40 (35%)
Upper limb	
• **Shoulder**	8 (7%)
• **Elbow**	2 (2%)

Types of self-management strategies prescribed in physiotherapy consultations:

Figure 1.1 shows the number of patients prescribed with each type of self-management strategy. After exercise (n = 105), advice was the most common strategy (n = 91). The type of advice given to patients was categorised using the following sub-headings which included advice to rest or refrain from a particular activity (n = 30); postural advice (n = 30); ergonomic advice (n = 5); advice to increase physical activity at home (n = 17); pelvic floor advice (n = 3); advice to complete exercises/walking in water (n = 4); and advice about mobility aid use (n = 2). The least frequently observed strategies were self-taping and self-mobilisation (n = 2; 2% each) (figure 1). Exercise was the only self-management strategy prescribed in isolation; all other strategies were prescribed to patients in combinations of two or more strategies. The largest range of self-management strategies were prescribed to patients attending with a neck or lower back complaint; with 79 patients receiving prescriptions from a total of seven different strategies; including exercise, advice, heat, self-massage, self-mobilisation, lumbar roll and self-taping. In addition, physiotherapists were observed to provide supplementary printed information to 59 of the 108 patients (55%) who were prescribed with a self-management strategy, most frequently related to exercise (n=38).

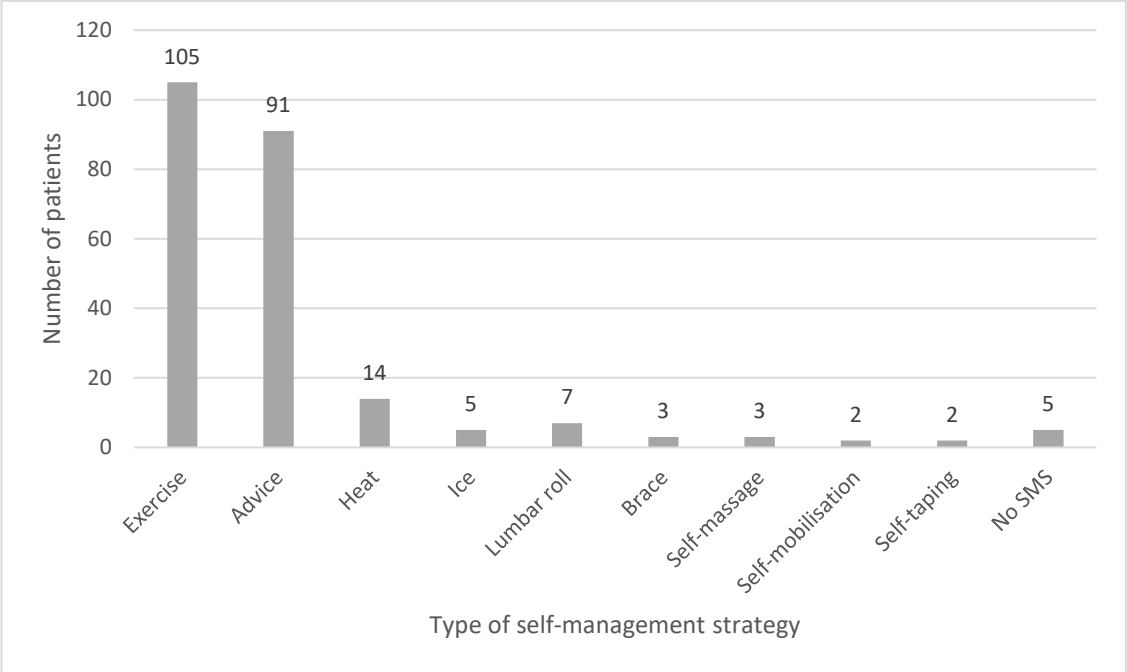

Figure 1.1: Number of patients prescribed with each type of self-management strategy. Key: SMS: Self-management strategy.

Number of self-management strategies prescribed in physiotherapy consultations

Overall, 108 patients were prescribed at least one self-management strategy (96%). A total of 232 self-management strategies were prescribed to these patients (mean n = 2.15 strategies per patient, SD = 1.05). Of the 108 patients who received a self-management strategy; 32 patients received only one self-management strategy (all in the form of exercise); 50 patients received two self-management strategies, most commonly in the form of exercise and advice (n=40); 16 patients received three strategies (commonly observed combinations included exercise, advice, heat or lumbar roll); and 10 patients received four strategies (from a combination of exercise, advice, heat, ice and brace). Five patients were not observed to receive a self-management strategy.

By consultation type:

The average number of self-management strategies prescribed in initial consultations was 2.74 (SD =1.19), and in follow-up consultations was 1.86 (SD =0.80). However, there was no statistically significant association between consultation type (initial versus follow-up) and number of self-management strategies prescribed when

controlling for injury location, time spent prescribing self-management strategies and overall consultation time (IRR = 0.86, p=0.29).

By injury location:

When broken down by injury location, the five patients who were not prescribed a self-management strategy, all had attended for physiotherapy of their lower back, (Table 1.2). All three patients who attended for physiotherapy of their upper back received only one self-management strategy (exercise). The largest number of prescribed self-management strategies were to patients attending for treatment of knee, lower back and neck issues (n=4).

When injury locations were grouped into three body regions (lower limb, spine and upper limb), the average number of self-management strategies prescribed to individuals being treated for lower limb injuries was 2.29 (SD = 1.14), for injuries to the spine was 2.01 (SD = 1.09), and injuries to upper limbs was 2.62 (SD = 0.52). Despite these observations, there was no statistically significant association between the number of self-management strategies and injury location (lower limb [reference category], spine [IRR = 0.85, p = 0.14], upper limb [IRR = 1.22, p = 0.08]) when controlling for consultation type (initial versus follow-up), and overall consultation time.

Time spent on self-management strategies:

The overall length of consultation time varied from 60 minutes for an initial consultation down to 17 minutes for a follow-up consultation, with consultations being an average of 26 minutes long (SD = 9.22). Table 1.2 shows that overall; an average of 5.80 minutes per consultation was spent on self-management strategies (22% of total consultation time). The mean consultation time spent per strategy was 2.71 minutes. When patients were prescribed exercises only (n = 32), physiotherapists spent a mean time of 4.23 minutes prescribing exercises to their patients. However, when physiotherapists prescribed exercise in combination with one or more self-management strategy, the total mean time physiotherapists spent on self-management strategies was 6.53 minutes (including the time spent to prescribe the exercises).

Table 1.2: Time spent on self-management strategies; number of prescribed self-management strategies; and time spent per self-management strategy (by injury location and overall).

Location of injury	Time (minutes) spent on self-management strategies Mean (range)	Number of self-management strategies provided Mean (range)	Time (minutes) spent per self-management strategy Mean
Ankle	4.3 (4-5)	1.7 (1-2)	2.5
Knee	5.9 (2-10)	2.7 (1-4)	2.2
Hip	6.5 (1-15)	1.5 (1-3)	4.3
Lower back	6.1 (0-30)	1.9 (0-4)	3.2
Upper back	1.0 (1)	1.0 (1)	1.0
Neck	5.9 (1-15)	2.1 (1-4)	2.8
Shoulder	4.8 (1-13)	2.4 (2-3)	2.0
Elbow	4.0 (4)	3.0 (3)	1.3
Overall	***5.8 (0-30)***	***2.0 (0-4)***	***2.7***

By consultation type:

The observed consultation time that physiotherapists spent prescribing self-management strategies varied greatly between patients. One physiotherapist was observed to spend 30 minutes (or 50% of total consultation time) of an initial consultation prescribing self-management strategies. The least amount of time spent prescribing a self-management strategy in an initial consultation was one minute (3% of total consultation time). During follow-up consultations, the most amount of time observed on self-management strategies was 15 minutes (50% of consultation time); with the least being 0 minutes (0% of consultation time). However, on average physiotherapists spent approximately 9.31 minutes (SD = 7.91) on self-management strategies during an initial consultation (25% of the total consultation time) and 5.10 minutes (SD = 3.89) during a follow-up consultation (21% of total consultation time). Results from the Gamma regression model indicated that there was no statistically significant association between consultation type (initial versus follow-up) and the fraction of time spent on self-management strategies, when controlling for injury location (a 14% increase in the fraction of time spent on prescription of self-management plans for physiotherapists, p=0.43).

By injury location:

Table 1.2 shows the mean amount of consultation time spent on self-management strategies overall and per strategy for each injury location. When considering self-management prescription time allocations by injury location, the most amount of time spent per strategy was with patients presenting with hip injuries, where physiotherapists spent over four minutes per strategy; these patients also received a small number of strategies (three patients received exercise only and one patient received exercise and advice). Patients presenting with injuries of their upper back received only one minute of exercise prescription prescribing the patient exercise.

When injury locations were grouped into three body regions the amount of consultation time spent on self-management strategies for lower limb injuries was 6.23 minutes (SD = 3.20), for injuries to the spine was 5.81 minutes (SD = 5.54), and injuries to upper limbs was 4.71 minutes (SD = 3.39). Despite these observations, there was no statistically significant association between injury location (lower limb [reference category], spine [p = 0.25], upper limb [p = 0.20]) and the amount of consultation time spent on self-management strategies when controlling for consultation type (initial versus follow-up).

Discussion

Clinical practice requires a complex interplay between experience and training, research, guidelines and judgement; and should not only be informed by randomised controlled trials, but also by pragmatically designed studies that better reflect real-life clinical practice (19). Our data were derived from clinical observations, and is therefore more likely to reflect real world physiotherapist-patient consultations compared to self-reported surveys which can be subject to reporting bias (8, 20).

An overwhelming majority of patients (96%) received a self-management strategy, with physiotherapists observed to prescribe from a range of nine different strategies to their patients. This prescribed range has been supported to varying degrees in the literature, with exercise and heat commonly being prescribed to patients with lower back pain (21); as well as advice (11), splints (22), heel lifts (23), ice (24) and braces (10). Given the range and frequency of self-management prescription by physiotherapists in past research (16) and the current study, it could be argued that

physiotherapists consider self-management strategies to be an important part of the overall patient treatment plan.

Exercise was prescribed in 93% of consultations indicating that it has a central role in physiotherapy practice. All patients in our study, regardless of injury location, were given home exercise with the exception of eight patients with lower back or knee injuries. Thirty-two patients (28%) were prescribed exercise only. This observation is not unexpected given that research relating to the effectiveness of home exercise is abundant (25-30).

Advice was the second most observed strategy followed by the use of heat. Advice has been self-reported by physiotherapists as the most commonly prescribed supplement to clinic-based care for patients with back pain (11). The observed frequency of heat versus ice may be more related to the chronicity of the injury although time since injury was not recorded. Least commonly prescribed self-management strategies were self-mobilisation, self-taping and self-massage.

It is encouraging that physiotherapists are integrating the prescription of self-management strategies into routine practice, particularly given the presence of supportive research regarding the effectiveness of a number of strategies (9). However, more high quality research is needed to support the effectiveness of a number of strategies; in particular physiotherapeutic advice, which can vary in content between clinicians. Therefore, although self-management strategies could be considered an important treatment adjunct, clinicians should refer to injury location-specific best-practice evidence when prescribing self-management strategies to their patients.

In our study, patients received a mean of two self-management strategies per observed consultation, most commonly in the form of exercise and advice. This number of strategies is supported by a qualitative study on patients with chronic low back pain (21). However, 26 patients received three or more self-management strategies most commonly in the form of exercise, advice and heat. Patients attending for physiotherapy of their neck and lower back received the greatest range of self-management strategies. The effectiveness of a range of management approaches for these injury locations has been reported (31-33).

Patients were observed to receive more self-management strategies during an initial consultation (n = 2.74) compared with a follow-up consultation (n = 1.86). The clinical rationale for this might be to provide patients with a larger number of self-management strategies at the outset of treatment to facilitate patient recovery. However, when multiple treatment approaches are used concurrently it can be difficult to determine which one/s have been effective. The provision of multiple strategies may also have implications for patient adherence, particularly when a patient may already be overwhelmed with other information related to their injury and prognosis. There is evidence that providing more complex information results in poorer recall of information provided in health care consultations (34, 35). This suggests that providing multiple self-management strategies may adversely impact on recall, and hence, adherence to the prescribed strategies.

Physiotherapists spent a mean time of 5.80 minutes on self-management strategies (inclusive of initial and follow-up consultations). This represents a mean of 22% of consultation time. However, the adequacy of this time might vary depending on the whether the physiotherapist has prescribed the strategy before; how complex the strategy is and whether the patient understands what they are being asked to do. A systematic review of interventions to aid patient adherence to physiotherapist prescribed self-management strategies reported a mean rate of adherence of 67% (15). It would be interesting to explore whether patient adherence is impacted by the number of prescribed strategies and the overall time physiotherapists spend prescribing self-management strategies during a physiotherapist-patient consultation. In our study, patients attending for treatment of knee injuries were prescribed approximately three self-management strategies each (above the overall study mean) with physiotherapists spending about two minutes per strategy (below the overall study mean). This suggests that clinicians need to be careful that quantity of self-management prescription does not adversely impact on overall prescription time; as this may potentially diminish the quality of self-management prescription, potentially impacting on treatment plan adherence and outcomes.

It has been reported that the more individual exercises contained within an exercise program, the less patients are likely to adhere to them (35). Therefore, the same might be true of the number of individual self-management strategies prescribed.

Although the relationship between time spent on prescribing self-management strategies and patient adherence and outcomes has not been explored in physiotherapy, there is research into information provision from other areas of health care practice suggesting that “less may be more”. General practice consultation time has been reported as averaging between 18-23 minutes (36), which is not dissimilar to physiotherapy. Research suggests that general practitioners with longer consultation times prescribe less; offer more advice on lifestyle and other health promoting activities, and that longer consultation time is associated with a range of better patient outcomes (37). Therefore, it may be more appropriate for physiotherapists and other healthcare professionals to prescribe fewer self-management strategies and spend more time on promoting adherence to a single strategy to encourage optimisation of patient outcomes.

Limitations:

Although this observational study is novel in researching physiotherapist use of prescribed self-management strategies in private practice settings, some limitations exist. Generalisability may have been limited by patients only being recruited from four private physiotherapy practices in two Australian cities. A consecutive sample of patients was utilised to reduce selection bias, however some bias is still present due to convenience sampling. As with any observational research, it is possible that physiotherapists and patients altered their behaviour due to the presence of the researcher. The researcher did, however, attempt to minimise this bias by providing minimal details about the study’s aims to both physiotherapists and patients during recruitment.

Research Implications:

Given the frequency with which self-management strategies are prescribed, more research is required to support the efficacy of these strategies. The allocation of consultation time to self-management prescription and its impact on patient adherence and outcome also requires further investigation.

Conclusion:

Australian private practice physiotherapists were observed to regularly prescribe self-management strategies to their patients; most frequently in the form of exercise and

advice. The largest range of strategies was prescribed for patients presenting with neck and lower back injuries (the most commonly treated patient injury areas). These results suggest that self-management strategies such as exercise, advice and the use of heat/ ice are considered an important treatment adjunct to in-clinic care. However, clinicians should reflect on which self-management strategy is the most appropriate for each patient based on individual need, and allocate consultation time appropriately to maximise patient adherence and treatment outcomes.

Practice implications:

Physiotherapists and other healthcare professionals, in their pursuit of evidence-based practice, should critically evaluate their clinical decisions regarding patient self-management strategies. Clinicians need to ensure that they are selecting the most appropriate strategy for each patient based on empirical research findings and be encouraged to consider a number of factors when determining how many strategies to prescribe. This may include whether prescription of multiple strategies will result in poorer adherence and hence compromise patient outcomes. Clinicians also need to reflect on the most appropriate use of patient consultation time when prescribing self-management strategies given that there are other competing priorities such as assessment and 'hands-on' treatment. Physiotherapists and other healthcare professionals should be encouraged to invest time in prescribing self-management as an extension to in-clinic treatment whereby potentially improving patient outcomes.

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Conflicts of interest:

The authors have no conflicts of interest to declare.

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References

1. Fransen, M., *When is physiotherapy appropriate?* Best Pract Res Clin Rheum, 2004. **18**(4): p. 477-89.
2. Perreault, K., et al., *Physiotherapy practice in the private sector: organizational characteristics and models.* BMC Health Serv Res, 2014. **14**(1): p. 1-13.
3. Beddow, A., *Physiotherapy workforce review*. 2010, Centre for workforce intelligence: UK. p. 1-12.
4. Engel, R.M., et al., *The provision of chiropractic, physiotherapy and osteopathic services within the Australian private health-care system: a report of recent trends.* Chiropr Man Therap, 2014. **22**(1): p. 3.
5. Grimmer-Somers, K., et al., *Number and Frequency of Physiotherapy Services for Motor Vehicle-induced Whiplash: Interrogating Motor Accident Insurance Data 2006 & 2009.* J Rehabil Med, 2012. **44**(9): p. 774-780.
6. Hall, A.M., et al., *Measurement Tools for Adherence to Non-Pharmacologic Self-Management Treatment for Chronic Musculoskeletal Conditions: A Systematic Review.* Arch Phys Med Rehabil, 2014. **31;96(3):552-62.**
7. Lorig, K.R. and H. Holman, *Self-management education: history, definition, outcomes, and mechanisms.* Ann Behav Med, 2003. **26**(1): p. 1-7.
8. Peek, K., et al., *Patient adherence to physiotherapist prescribed self-management strategies: A critical review.* Int J Ther Rehabil, 2015. **22**(11): p. 535-543.
9. Novak, I., *Effective home programme intervention for adults: a systematic review.* Clin Rehabil, 2011. **25**(12): p. 1066-1085 20p.
10. Page, C.J., R.S. Hinman, and K.L. Bennell, *Physiotherapy management of knee osteoarthritis.* Int J Rheum Dis, 2011. **14**(2): p. 145-51.
11. Liddle SD, Baxter GD, and G. JH, *Physiotherapists' use of advice and exercise for the management of chronic low back pain: A national survey.* Man Ther, 2009. **14**: p. 189-196.
12. Fidvi N, M.S., *Physiotherapy management of low back pain in India- a survey of self-reported practice.* Physiother Res Int, 2010. **15**: p. 150-159.
13. McGrane, N., et al., *Motivational strategies for physiotherapists.* Phys Ther Rev, 2014. **19**(2): p. 136-142.

14. Vandenbroucke, J.P., et al., *Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration.* Epidemiol, 2007. **18**(6): p. 805-35.
15. Peek, K., et al., *Interventions to aid patient adherence to physiotherapist prescribed self-management strategies: A systematic review.* Physiother, 2016. **102**(2): p. 127-135.
16. Peek, K., et al., *Physiotherapists' perceptions of patient adherence to prescribed self- management strategies: A cross-sectional survey of Australian physiotherapists.* Disabil Rehabil, 2016 **available at: http://dx.doi.org/10.1080/09638288.2016.1212281**.
17. Cohen, J., *A power primer.* Psych Bulletin, 1992. **112**(1): p. 155-9.
18. de Nijs, R. and T.L. Klausen, *On the expected difference between mean and median.* Electron J App Stat Anal, 2013. **6**(1): p. 110-117.
19. Price, D., et al., *Real-world research and its importance in respiratory medicine.* Breathe, 2015. **11**(1): p. 26-38 13p.
20. Kettler, L.J., et al., *Determinants of adherence in adults with cystic fibrosis.* Thorax, 2002. **57**(5): p. 459-64.
21. Crowe, M., et al., *Self-management and chronic low back pain: a qualitative study.* J Adv Nurs, 2010. **66**(7): p. 1478-86.
22. Sandford, F., N. Barlow, and J. Lewis, *A Study to Examine Patient Adherence to Wearing 24-Hour Forearm Thermoplastic Splints after Tendon Repairs.* J Hand Ther, 2008. **21**(1): p. 44-53.
23. Goss, D.L. and J.H. Moore, *Compliance wearing a heel lift during 8 weeks of military training in cadets with limb length inequality.* J Ortho Sports Phys Ther, 2004. **34**(3): p. 126-131.
24. Bassett, S.F. and H. Prapavessis, *A test of an adherence-enhancing adjunct to physiotherapy steeped in the protection motivation theory.* Physiother Theory Pract, 2011. **27**(5): p. 360-372.
25. Clijsen, R., J. Fuchs, and J. Taeymans, *Effectiveness of Exercise Therapy in Treatment of Patients With Patellofemoral Pain Syndrome: Systematic Review and Meta-Analysis.* Phys Ther, 2014. **94**(12): p. 1697-1708 12p.
26. Hayden, J.A., et al., *Exercise therapy for treatment of non-specific low back pain.* Cochrane Database Syst Rev, 2005(3): p. CD000335.

27. National Institute for Health and Clinical Excellence., *Physical activity: exercise referral scheme*, P.h. guideline, Editor. 2014, NICE: UK. p. 1-49.
28. Smidt, N., et al., *Effectiveness of exercise therapy: a best-evidence summary of systematic reviews.* Aust J Physiother, 2005. **51**(2): p. 71-85.
29. Taylor, N.F., et al., *Therapeutic exercise in physiotherapy practice is beneficial: a summary of systematic reviews 2002-2005.* Aust J Physiother, 2007. **53**(1): p. 7-16.
30. Tunwattanapong, P., R. Kongkasuwan, and V. Kuptniratsaikul, *The effectiveness of a neck and shoulder stretching exercise program among office workers with neck pain: a randomized controlled trial.* Clin Rehabil, 2016. **30**(1): p. 64-72.
31. Otoo, S.K.W., P. Hendrick, and D.C. Ribeiro, *The comparative effectiveness of advice/education compared to active physiotherapy (manual therapy and exercise) in the management of chronic non-specific low back pain.* Phys Ther Rev, 2015. **20**(1): p. 16-26 11p.
32. Searle, A., et al., *Exercise interventions for the treatment of chronic low back pain: a systematic review and meta-analysis of randomised controlled trials.* Clin Rehabil, 2015. **29**(12): p. 1155-1167 13p.
33. van der Velde, G., et al., *Which interventions are cost-effective for the management of whiplash-associated and neck pain-associated disorders? A systematic review of the health economic literature by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration.* Spine 2015. **available at: http://dx.doi.org/10.1016/j.spinee.2015.08.025**.
34. DiMatteo, M.R., K.B. Haskard-Zolnierek, and L.R. Martin, *Improving patient adherence: a three-factor model to guide practice.* Health Psych Rev, 2012. **6**(1): p. 74-91.
35. Henry, K.D. and C. Rosemond, *Effect of Number of Home Exercises on Compliance and Performance in Adults Over 65 Years of Age.* Phys Ther, 1999. **79**(3): p. 270.
36. Patwardhan, A., et al., *Comparison of Waiting and Consultation Times in Convenient Care Clinics and Physician Offices: A Cross-Sectional Study.* Prim Care Comm Health, 2013. **4**(2): p. 124-128.
37. Freeman, G.K., et al., *Evolving general practice consultation in Britain: issues of length and context.* BMJ, 2002. **324**(7342): p. 880-882.