Patient compliance to exercise prescription at the Victoria University Osteopathic Medicine Clinic.

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ABSTRACT

Background: Patient rehabilitation advice (PRA) is commonly used amongst a variety of health care practitioners to aid and enhance the recovery of their patients. Research has demonstrated a positive relationship between the level of adherence to PRA and recovery from a variety of musculoskeletal conditions, and has shown non-compliance to home-based exercise programs reduces the probability of successful outcome for therapeutic intervention. No previous research has focused on compliance to prescription and methods of prescription used in the osteopathic medicine setting.

Objectives: To establish compliance rates at Victoria University Osteopathic Medicine Clinic (VUOMC) to prescribed home-exercises and to assess current practitioner prescription methods at VUOMC.

Design: Prospective survey study.

Methods: Over a 5 week period, all consenting return patients of VUOMC were surveyed (N = 94) prior to the commencement of their return treatment visit on their adherence to exercises prescribed at the previous treatment using a tool developed by the researchers. Compliance of patients was calculated by comparing the participants' survey markings of prescription, to those recordings of the prescription made by the treating 4th and 5th year student practitioners in the participants' case file.

Results: Sixty-seven percent of return patients were prescribed PRA and 33% were not. Total compliance rate to PRA was 55(59%) of respondents, with 39(41%) non-compliant. When combining prescription methods into broader categories, Diagrams were used in 15% of cases to instruct patients in PRA compared to Verbal instruction in 80% of cases. Verbal instruction had a total compliance of 41(56%) and non-

compliance of 32(44%), compared to the Diagram total compliance of 11(61%) and non-compliance of 7(39%).

Conclusions: As exercise has been shown to augment treatment efficacy and speed of recovery, it is important that osteopaths are informed of the current likely adherence rate to PRA and all factors that may cause non-compliance to their exercise prescription. The overall compliance rate to PRA at VUOMC is comparable with previous studies, with the use of diagrams being the least utilised but most effective method of prescription in the VUOMC setting. This study provides a basis for understanding exercise prescription implications that are important both to osteopaths and osteopathic patients in enhancing treatment results in terms of speed and efficacy, as well as potentially reducing treatment costs to both patients and third party payers.

Keywords: compliance, exercise prescription, rehabilitation advice, diagrammatic prescription, osteopath

INTRODUCTION

Patient rehabilitation advice (PRA), the strengthening exercises and stretches prescribed by practitioners for completion outside of consultation time, is commonly used amongst a variety of health care practitioners to aid and enhance the recovery of their patients. As patient numbers grow, and time restrictions impact on many practitioners, PRA is becoming an essential adjunct to many manual therapy treatment regimes. Greater patient compliance to exercise prescription can create beneficial possibilities to not only the patient but also the community, with potential savings in treatment costs, and reduction of avoidable morbidity and unwanted side effects.[1] Research has demonstrated a positive relationship between the level of adherence to exercise programs and recovery from a variety of musculoskeletal conditions.[2-5] It has also been reported that non-compliance to home-based exercise programs reduces the probability of successful outcome for therapeutic intervention.[3] Despite the positive results shown with adherence to PRA, compliance to practitioner prescribed exercise is low, with a 40-50% dropout rate in the first six months.[4] Therefore, as the need for PRA grows, it is important for practitioners to understand which method of prescription will gain them the greatest amount of patient compliance, and in turn increase speed of patient recovery.

Numerous factors affect compliance, the degree to which the advice of a health professional is addressed and followed,[4] with several terms (compliance, motivation, adherence and non-compliance) having overlapping boundaries. Compliance can be described as both an attitude, consisting of the willingness or intent to follow the health prescription, or a behaviour that involves the actual carrying out of the prescription.[1] Non-compliance includes reluctance and behaviour characterised by

disinterest, refusal to comply, and/or lack of sustained effort to follow health recommendations.[1] Motivation, the influence that compels a person to pursue a physically demanding activity, can be divided into intrinsic and extrinsic motivation. Intrinsic being the internal reward offering the patient self-satisfaction gained from doing an activity, whereas extrinsic motivation is the performance of physical activity by the patient solely to obtain some external reward. Both intrinsic and extrinsic factors can be motivation for complying with a home-based exercise program, and it is necessary for the practitioner to identify these factors to increase adherence to the exercise prescription.[3,6] Adherence is participant continuation in an activity once it has been initiated. This is often ceased once a patient reaches their health goal or a level of perceived well-being has been achieved.[3] The overlapping themes in compliance, non-compliance, and adherence, which result in the patient completing the exercise prescription, are what were explored in this study.

Comparisons have been made of compliance of exercise prescription compared with drug prescription, one finding that in Rheumatoid Arthritis patients 40% were compliant with exercise compared with a 78% compliance rate to Aspirin use.[7] A further review of compliance literature for arthritis found that compliance to medication was consistently higher than that of Physiotherapy regimes, with compliance of patients to the Physiotherapists' regime ranging from 34 - 63%.[8] Osteopathic PRA differs from that of other medical fields stemming from the basic principals of osteopathy, where treatment plans revolve around the body is a unit and structure governs function. Specific exploration into the factors contributing to osteopathic prescription adherence needs to be considered to enable the greatest possible treatment efficacy result for practicing osteopaths and their patients.

Schneiders et al[1] found studies assessing exercise prescription adherence to date have focused on percentages of compliance, the characteristics of compliers and non-compliers, and various interventions and their effect on compliance. Minimal focus has been placed on exploring the methods in which the exercise was prescribed. Schneiders et al[1] reported that within their study patients' who received their prescription verbally, with reinforced written and illustrated material, adhered to their prescription at a significantly higher level than those patients who were prescribed solely via verbal communication. Sherman[9] has found that writing prescriptions on paper reinforced verbal recommendations, and further research needs to investigate the validity behind this statement.

No previous research has focused on compliance to exercise prescription or use of PRA, and methods of PRA prescription in the osteopathic medicine setting. Exercise has been shown to be an essential part of rehabilitation, and methods to ensure the highest level of compliance are imperative to the osteopathic practitioner not only to enhance treatment results for the patient in speed and efficacy, but also to reduce treatment costs to the patient and third party payers.[1-5] This study will provide practicing osteopaths with guidance towards methods of exercise prescription that will allow the greatest likelihood of patient compliance.

The main aim of this study was to establish a base compliance rate of patients attending the Victorian University Osteopathic Medicine Clinic (VUOMC) to prescribed home-exercises from treating practitioners. Further aims of this study were to assess the methods of practitioner prescription currently used at VUOMC; to

associate patient injury types with home exercise compliance rates; and to link patient lifestyle constraints to home exercise compliance rates.

METHOD

Participants

All patients from the return patient list of VUOMC were invited to participate in this study. Sample size consisted of the first 103 willing participants of this return patient base at the VUOMC over a 5 week period. Those patients not given any PRA in their previous treatment were used to investigate which injury presentation types and demographic groups were not prescribed exercises, and their numbers, together with the numbers of patients for whom exercises were prescribed, were used to calculate the overall prescription rate.

Procedure

Survey content:

A survey was developed from the existing research literature and was circulated to all returning patients to complete. The survey assessed whether the patient was previously prescribed exercises to aid their recovery, the prescription method that was used to articulate the PRA to patients, the patients' understanding of the PRA prescribed, the area of complaint for which the PRA was prescribed and specific demographic questions to establish the lifestyle situation of the patient. Patient compliance to the PRA was established from the single question Home Exercise Compliance Assessment (HECA), a single written question asking how many of the prescribed home exercise sessions were completed.[2]

The survey was piloted on five return patients of the VUOMC and experts in the field of osteopathy and exercise rehabilitation to establish content and face validity, and to assess the comprehensibility and structure of the survey. After the pilot phase, minor comprehensibility amendments were made to the survey. Ethics approval to perform the study was gained from the Human Research Ethics Committee in the School of Health Sciences at Victoria University. The completion and return of the survey by the patients implied consent to be participants within this study.

Testing on population

The PRA compliance of the return patients of VUOMC was then measured by surveying all consenting return patients over a 5 week period (N = 103) on their adherence to exercises prescribed at the previous treatment. The patients' were asked to complete the survey prior to the commencement of their return treatment visit at VUOMC. The survey took approximately two to three minutes to complete. At the completion of the survey, the patient placed the survey into a locked box ensuring privacy of the patient was preserved.

The 4th and 5th year students of Victoria University's Osteopathy course, who are the treating student practitioner body of VUOMC, were informed that the study was being conducted to ensure all return patients were given the opportunity to complete the survey prior to treatment. Both year levels of students were instructed to continue to treat and prescribe exercises at the VUOMC as they would normally. The 4th and 5th year students were informed this study was an assessment of patient compliance rates, with investigations into factors such as injury type and lifestyle constraints on patient compliance rates, and were assured that this study was not an evaluation on

their efficacy as practitioners. Any diagrams given to participants from 4th or 5th year treating student practitioners were from the exercise based software package Exercise-Pro, available to all students to use at VUOMC under license.

Compliance of participants was measured by comparing the participants' survey markings of prescription, to those recordings of the prescription made by the treating student practitioners in the participants' case file. The percentage of patient compliance was calculated by dividing the number of exercises completed by the number of exercises prescribed and multiplying by 100.[1]

Statistical Analysis

The survey results data were computed into Microsoft Excel, and expressed using descriptive data and percentages. This established the rate of compliance, the association between prescription method and compliance, and further links between compliance, lifestyle commitments, initial injury complaint and reasoning behind non-adherence of prescribed exercise. Verbatim responses were collated into common themes to provide insight into patients' ideas to increasing compliance to PRA.

RESULTS

The collection period began on the 16th of May 2005, and continued for a 5 week period until June 17th 2005 when there were 103 consenting surveys completed. From the 103 willing return patient participants of the VUOMC that completed the survey, 3 surveys were not placed within the locked box provided (and were subsequently destroyed by researchers), and 6 case files were unobtainable during the data collection period, leaving the total numbers of participants analysed as 94.

(INSERT TABLE 1 NEAR HERE)

According to the 94 participants, 63(67%) were prescribed exercises and 31(33%) were not prescribed exercises. These prescription results were different when compared to the amount of exercises prescribed sourced from practitioners' case notes that recorded 34(37%) were prescribed exercises, and 60(63%) did not receive prescribed exercises (figure 1). When further examination is made between the discrepancies between practitioners notes and patients surveys on those exercises prescribed, it was shown that of those 34 exercises prescribed according to the case notes, 25(27%) of practitioners' case notes agreed with their patients' survey data that they had been prescribed, and 9(10%) of practitioners notes were marked that exercises had been given, contradicting the patients' survey results. There was no record of prescribed exercises on 38(40%) of practitioners' case notes, despite the fact participants stated they had been prescribed exercises.

(INSERT FIGURE 1 NEAR HERE)

The most common presenting areas of injury to the VUOMC were the Neck 37(22%), Upper Back 35(21%) and Lower Back 31(18%) (table 2). PRA was frequently prescribed to participants when they presented with these most common areas of injury. Twenty-two (59%) of the participants presenting with Neck complaints were provided with prescribed exercises, compared to the 23(66%) of Upper Back and 23(74%) of Lower Back patients prescribed exercises at their previous treatment at VUOMC. However the exercises prescribed were not necessarily performed on the

area of presenting complaint, and were often for clinically related regions such as Neck stretches when patient presented with Upper Arm pain. When PRA was instructed to be directly performed on the Neck, 13(62%) of participants were compliant. Twelve (67%) of patients prescribed PRA to be performed on the Lower Back were compliant, and 5(50%) participants completed their exercises that were performed directly on the Upper Back. One hundred percent of participants that presented with complaints in the Upper Arm, Forearm, Wrist/Hand and Hip were prescribed exercises. Patients presenting with Pelvis, Upper Arm, Forearm, Knee and Calf complaints were provided with exercises, however in all cases the PRA given was not instructed to be performed directly on the area of injury (table 2). The most common areas of the body on which PRA was directly performed, was the Neck at 21(22%) and the Lower Back at 18(19%) (table 5).

(INSERT TABLE 2 NEAR HERE)

By merging types of prescriptions into larger groupings from all of the subgroups, Diagrams were used in only 15% of cases to instruct PRA compared to 80% usage for the combined Verbal subgroups (containing subgroups of Verbal Instruction, Shown by Practitioner and Practiced with Practitioner). Verbal Instruction used with Shown by Practitioner was the most common method used to give PRA at 14(22%), followed by the Verbal Instruction, Shown by Practitioner and Practiced with Practitioner combination with 12(19%). Most PRA was given using multiple methods of prescription (69%), compared to the 26% of prescriptions made using individual techniques.

(INSERT FIGURE 2 NEAR HERE)

When combining PRA modes into larger categories, Verbal had a total compliance of 41(56%) and non-compliance of 32(44%), compared to the Diagram total compliance of 11(61%) and non-compliance of 7(39%). Shown by Practitioner combined with Practiced with Practitioner was the PRA method which received the most compliance 7(70%), followed by Verbal Instruction, Given Diagram and Shown by Practitioner 6(67%), and Verbal Instruction, Given Diagram, Shown by Practitioner and Practiced with Practitioner 4(67%). The least compliant modes of prescription were those methods used individually, and also Verbal Instruction and Practiced with Practitioner 2(40%).

(INSERT TABLE 3 NEAR HERE)

The total compliance rate according to the participants was 55(59%) of patients compliant to exercises prescribed, with 39(41%) not compliant. According to participants' survey results, compliance slightly decreased as more exercises were prescribed, from 38(60%) with one exercise to 1(50%) with four exercises. From the total 94 PRA instructions given within this study, fewer prescriptions were given in multiples. Sixty-three of the PRAs were for single exercises, compared to 31 PRAs advised in multiple doses (summing amounts of exercises prescribed in 2's, 3's and 4's). It was difficult to assess overall compliance by comparing participants' survey recordings and practitioner case notes, due to the large number of case notes which had no recordings of exercises 62(55%), even though patients recorded receiving PRA. Not having PRA recordings on the participant file then made it difficult to

assess whether there was exact adherence to what was prescribed, and as the patients' survey results were a more accurate reflection of the prescription rate at VUOMC they were used to calculate the total compliance rate.

(INSERT TABLE 4 NEAR HERE)

Stretches were the most commonly prescribed PRA at 73(78%), compared to strengthening exercises 16(17%) (eg. Stabilization techniques, Isometric contractions, Isotonic contraction etc), with 30 seconds noticeably being the most prescribed PRA duration 46(52%). Most of the prescriptions included instructions for the exercise or stretch to be performed everyday 82(92%), or twice a day 32(36%).

(INSERT TABLE 5 NEAR HERE)

For the 54 exercises female participants were prescribed, they tended to be slightly more compliant 33(61%) than the males within the study who completed 22(55%) of the 40 exercises they were given. The older age groups proved to be more compliant than the younger groups. In the 50 -59 years of age group 17(68%) were compliant out of 25 exercises being prescribed and in the 60 plus years of age group 7(88%) were adherent out of 8 exercises instructed. Advanced Clerical and Service Workers were the most compliant 13(76%), and those with higher education levels such as PhD 3(100%) and Masters 9(90%) had higher levels of compliance. Inner City, Western suburbs and Out of Melbourne were the least compliant participant areas, and increases in number of children did not seem to affect compliance rates, with participants with 3 children at 4(80%) compliance.

Ninety nine percent of those participants prescribed exercises claimed to remember and understand the prescriptions they were instructed to complete, despite the total compliance to completing exercises being 55(59%). Of the 16 participants who made suggestions to improve the explanation of exercises given to them, 7 recorded that they would like some form of take home information, and 5 reported that they would like some diagrams to accompany their current prescription method.

DISCUSSION

The benefits of health practitioners' treatment are reliant on the compliance of the patient to all aspects of the treatment. Kolt and McEnvoy[2] found that the effectiveness of physiotherapy was dependent on adherence of patients to several components of their treatment plan, and that there is a positive relationship between adherence to rehabilitation programs and recovery from a variety of musculoskeletal conditions. It has also been reported that non-compliance to home-based exercise programs reduces the probability of successful outcomes for therapeutic intervention.[3] Despite the recognised benefits of PRA from practitioners in aid of a specific ailment, non-compliance is still a large factor in treatment efficacy. No accessible studies have been conducted using prescription of exercises by osteopaths, making it difficult to conclude the relevance of previous studies for osteopaths, and their findings on compliance to exercises.

The overall compliance rate to PRA within the return patient population of VUOMC, was 55(59%) compliance and 39(41%) non-compliance using multiple methods of prescription, and was consistent with rates found by Sluijs et al,[12] who reported one

third to two thirds of patients to be non-compliant to therapeutic exercises in general and Taylor et al[13], who found over half of participants to be non-compliant to rehabilitation exercises to some degree. When combining all Diagrammatic prescriptions within this study, the total compliance rate was 11(61%). This rate was higher than when all of the Verbal derivatives were combined giving a total compliance rate of 41(56%), showing Diagrams to be the superior method of PRA at the VUOMC. The rate of adherence with diagrams given as a prescription mode was slightly lower in this study when compared to previous studies, as Kolt and McEnvoy[2] found that participants completed 71.6% of their prescribed home exercise sessions when they were prescribed via exercise instruction sheets containing clear diagrams and standard instructions, and Schneiders et al.[1], who discovered a significantly higher compliance (77.4%) in the group who received additional written and illustrated instruction, compared to the group which received verbal instruction alone (38.1%).

Shown by Practitioner and Practiced with Practitioner, when combined, was the method of prescription that received the most compliance at 7(70%). This was a higher rate of adherence than compared to Schneiders et al.[1] study, where both methods were classified as part of verbal instruction which received 38.1% compliance, and Spelman[14] who reported a 30% compliance rate to exercise therapy in the control group of a cohort of chronic low back pain patients. However, small numbers within this subgroup of the current study may account for this unexpected result. Using diagrams as part of a prescription method obtained high compliance, at 6(67%) when combined with Verbal Instruction and Shown by Practitioner, and 4(67%) when used in conjunction with Verbal Instruction, Shown by Practitioner and

Practiced with Practitioner. Multiple methods of prescription were the most favoured form of prescription used by treating student practitioners at VUOMC at 69%, and resulted in greater compliance (average compliance 61%) than those techniques used individually (average compliance 54%). Little et al.[15] found that using the same information in slightly different and more detailed formats results in no reinforcement of instructions, indicating that if multiple methods of prescriptions are used they must mimic each other precisely in content to receive optimal compliance, which was assumed to be the case at VUOMC.

Of the 16 patients who recorded suggestions to improve the explanation of PRA, the requests for take home information and accompanying diagrams to their current prescription method corresponded with previous data found from other medical professions that diagrams aid compliance.[1,11,15,16] To improve the compliance rate at the VUOMC (overall 59%), students need to use more diagrammatic prescriptions and become more familiar with the computer diagram exercise program (Exercise-Pro), available for use at the VUOMC under licence, as diagrams have been shown previously to enhance compliance.[1,11,15,16] Schneiders et al[1] suggest written and illustrated instructions may enhance compliance by increasing understanding, stimulating memory processes, enhancing information recall, and overall augmenting communication between patient and physiotherapist. They reason that illustrations and diagrammatic representations of the written word enhance the understanding and facilitation of correct performance of the exercise prescribed, and indirectly make the written instructions more attractive, which in turn increases the likelihood of the patient to read the prescription, and consequently results in greater compliance to the regimen prescribed.[1] Little et al.[15] state that provision of the same information in

identical written and oral forms enhances outcomes of prescription. Sluijs et al.[12] concluded that patients will be more compliant when they are extensively instructed, and given more information, clarification and details by their treating practitioner, and will also have improved adherence when patients have a good relationship with their therapist. With all studies indicating that more detailed instructions, and more specifically the use of take-home diagrams enhancing the compliance to PRA, further research could confirm these findings.

Other methods of prescription that could be explored to be utilized within the VUOMC to further improve adherence may include positive reinforcement, goal setting and a written contract between therapist and patient, as suggested by Kolt and McEnvoy.[2] Friedrich et al[17] suggested brochures could be used as an additional aid, but not as the sole instrument of education, and claimed that the therapist and booklet working together could reduce the number of supervised exercise sessions, and therefore reduce health care costs.

With the most common presenting areas to the VUOMC being spinal related, it is more imperative for osteopaths to prescribe exercises as part of the long term rehabilitation process considering the substantial evidence advocating it.[2,18,19] The compliance rate for all of the spinal areas was similar to that of overall compliance, comprising 62% for neck, 50% for upper back and 67% for lower back region. Compliance to exercise prescription for low back pain has shown to be an effective preventive intervention, and should be incorporated into an osteopathic treatment plan.[20]

As the number of PRA's given to participants increased, the compliance rate decreased within this study (from 60% compliance with one exercise to 50% compliance with four exercises), indicating that both the number of exercises prescribed and the time taken to perform them are factors in adherence. In previous studies these boundaries have been standardized to limit their effect on compliance when measuring other aspects involved in PRA. In Schneiders et al.'s[1] study, physiotherapists were limited to prescribing no more than four exercises, and in Kolt and McEnvoy [2] research the 3 exercises prescribed were to take no longer than 12 minutes to complete. Limited studies have further investigated what is the optimal number of exercises to prescribe and the duration PRA should take to increase compliance.

The difference in compliance between sexes has not been consistently clear in previous studies.[2,12] This was also demonstrated within this study with 33(61%) female compliance and 22(55%) male compliance, despite different roles within family and career. The elder age groups reported doing their exercises regularly within this study, in accordance with findings from Sluijs et al.[12] With the elderly age patients', compliance has been shown to be dependent on whether the primary health care practitioner showed an active interest in whether the patient has completed the exercises asked of them.[9] Our study was in concordance with Wilbur et al.[21] showing that marital status and number of children had no influence over either self-efficacy, self-determination, or adherence to prescribed PRA. Those with higher levels of education tended to be more compliant, contradicting findings from Sluijs et al. who found the less educated were more compliant,[12] but with small samples in this subgroup it is difficult to draw conclusions within this study.

Steps within this study to attempt to measure compliance in its most exact form (comparing exercises recorded on patients' case notes to those marked on surveys by the patient) were unsuccessful as many of the practitioners failed to mark their case notes with their prescriptions, with 62(55%) of the total 112 exercises prescribed not being recorded in the case notes. According to the Australian Osteopathic Associations Record Keeping Guidelines for Osteopaths[22] 2005/2006 clinical notes are "an account of the interaction that has taken place between practitioner and patient", and "all details of the treatment and general observations should be noted". Following the AOA's[22] guidelines for sufficient clinical notes, the lack of PRA recording on case notes at VUOMC is an area in which treating student practitioners and registered practitioners need to be vigilant and diligent. Failures to take due care in the recording of case notes may have future medicolegal implications on individual practitioners. It is the treating practitioners' responsibility to ensure all aspects of the consultation and treatment are adequately recorded for future reference.

In this study it was difficult to assess the exact degree of compliance with which participants' were completing their PRA, due to the lack of prescription recording on the patient case files which could have been used to compare to patients' recollection of prescription. Hence compliance results within this study were dependent on patients' accurate recollection of their adherence. Kolt and McEnvoy [2] and Schneiders et al [1] saw similar limitations to measuring compliance within both of their studies, as patients were aware the study was assessing adherence to home exercises, and the measure of compliance was dependent solely on the patient's honesty and ability to remember the number of sessions they performed in the previous week. This makes

both studies[1,2] prone to recall and bias problems with a compliance rate that is ultimately subjective. Subjectivity is a common problem in studies trying to measure actual compliance to exercise prescription. Sluijs et al.[12] claimed it was difficult to assess patients' compliance because patients often don't admit to non-compliance, and compliance is not a matter of all or nothing but has many gradations. Numerous studies have focused on the compliance to actual participation of prescribed exercises, without exploring whether patients were actually performing the exercises correctly (frequency, duration, intensity and actual performance). Correct performance of the prescribed exercises is vital in optimizing the proposed benefits for the patient. Friedrich et al[17] found a strong correlation between increased quality of exercise performance and a decrease in reported pain. Wilbur et al[21] found that once the women in a 24-week home based walking program adhered to the frequency of the prescribed exercise, their adherence to duration and intensity was greater than 90%, indicating that once the prescribed exercise was performed it was performed correctly. A more accurate form of measuring compliance, in future study designs, that does not rely on the recollection of participants, will enable less subjective compliance rates, and will in turn aid the further research into PRA and its associated adherence.

A possible limitation within this research may have been the bias behind participants reasoning when choosing whether they wished to complete the survey, and be part of this study. It is possible that some patients may have wanted to highlight their compliance, which encouraged them to participate within this study. Whilst other patients may have been disappointed with the PRA they received, which influenced their reasoning behind completing the questionnaire. A further limitation of the current study includes a limited sample size of 103. A larger sample size would have

ensured larger numbers in subgroups, which would have allowed findings that are more reflective of the entire population. Further investigation in this research area is continuing within the VUOMC.

CONCLUSION

As exercise has been shown to augment the treatment efficacy and speed of recovery,[2-5] it is important that osteopaths are informed of the current adherence rate to PRA and all factors that may cause non-compliance to their exercise prescription. This study was successful in assessing adherence to exercises within a clinical osteopathic setting at the VUOMC, finding a total of 59% compliance to PRA, as well as identifying the most popular prescription methods (verbal instructions) and the most compliant PRA techniques (diagrammatic prescription). As research is limited in the field of adherence to exercise rehabilitation for osteopathy, future studies should compare the most popular exercise prescription methods found, and incorporating participants requests from within this study, assess whether take-home diagrams will enhance the compliance of osteopathic patients. This study provides a basis for understanding exercise implications that are important both to osteopaths and osteopathic patients, in enhancing treatment results in terms of speed and efficacy, as well as potentially reducing treatment costs to both patients and third party payers.

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Table 1 Baseline demographic and clinical characteristics of sampled population

Demographic and Clinical Characteristic		Total n = 94
Sex, n (%)	Male	32(34%)
	Female	62 (66%)
Mean Age ± SD, y		35.5 ± 6.0
Marital Status, n(%)	Divorced	2(2%)
	Married	28(30%)
	Defacto	4(4%)
	Single	56(60%)
	Separated	2(2%)
	Did not specify	2(2%)
Profession, n(%) [10]	Managers & Administrators	4(4%)
	Professionals	21(22%)
	Associate Professionals	8(9%)
	Tradesperson & Related workers	0(0%)
	Advanced Clerical & Service Workers	17(18%)
	Intermediate Clerical, Sales & Service Workers	2(2%)
	Intermediate Production & Transport Workers	1(1%)
	Elementary Clerical, Sales & Service Workers	1(1%)
	Laborers & Related Workers	0(0%)
	Student	29(31%)
	Unemployed	11(12%)
Highest Level of Education n(%)	Secondary	37(39%)
	Tertiary	32(34%)
	Graduate Diploma/Post Graduate	13(14%)
	Masters	5(5%)
	PhD	3(3%)
	Did not specify	4(4%)
Parity n(%)	0	67(71%)
	1	11(12%)
	2	9(10%)
	3	4(4%)
	4	3(3%)
Suburb n(%) [11]	Inner City	29(31%)
	Northern Suburbs	31(33%)
	Eastern Suburbs	14(15%)
	Southern Suburbs	6(6%)
	Western Suburbs	8(9%)
	Not in Melbourne	6(6%)
Total Respondents		**94**

Figure 1 Amount of exercises prescribed at last treatment

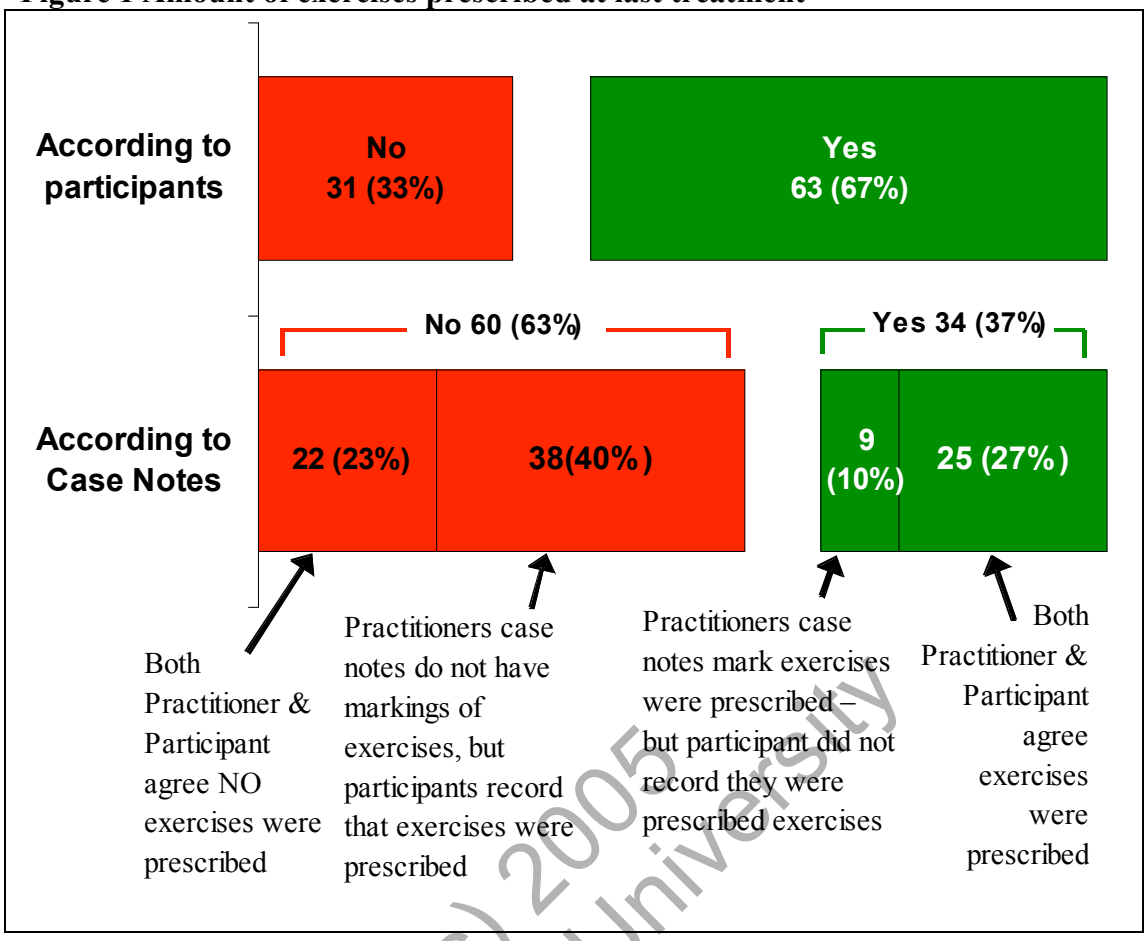

Table 2 Area of presenting injury and its rate of prescription and compliance

Area of Body	[+]Area of complaint	Prescribed exercises?		Compliant to PRA prescribed?	
		Yes	No	Yes	No
Neck n(%)	37(22%)	22(59%)	15(41%)	13(62%)	8(38%)
Upper Back n(%)	35(21%)	23(66%)	12(34%)	5(50%)	5(50%)
Lower Back n(%)	31(18%)	23(74%)	8(26%)	12(67%)	6(33%)
Pelvis n(%)	6(4%)	4(67%)	2(33%)	0(0%)	0(0%)
Upper Arm n(%)	3(2%)	3(100%)	0(0%)	0(0%)	0(0%)
Forearm n(%)	1(1%)	1(100%)	0(0%)	0(0%)	0(0%)
Wrist/Hand n(%)	4(2%)	4(100%)	0(0%)	1(25%)	3(75%)
Shoulder n(%)	23(14%)	14(61%)	9(39%)	9(69%)	4(31%)
Ankle/Foot n(%)	4(2%)	3(75%)	1(25%)	2(100%)	0(0%)
Knee n(%)	2(1%)	1(50%)	1(50%)	0(0%)	0(0%)
Thigh n(%)	5(3%)	4(80%)	1(20%)	5(71%)	2(29%)
Calf n(%)	2(1%)	1(50%)	1(50%)	0(0%)	0(0%)
Hip n(%)	11(6%)	11(100%)	0(0%)	5(56%)	4(44%)
Buttock n(%)	5(3%)	4(80%)	1(20%)	2(67%)	1(33%)
Cycling n(%)	-	-	-	1(100%)	0(0%)
No specified area n(%)	-	-	-	0(0%)	6(100%)
Total Respondents	**169**	**118(70%)**	**51(30%)**	**55(59%)**	**39(41%)**

Note: [+]Participants were allowed multiple responses to area of compliant.

Figure 2 Method of prescription

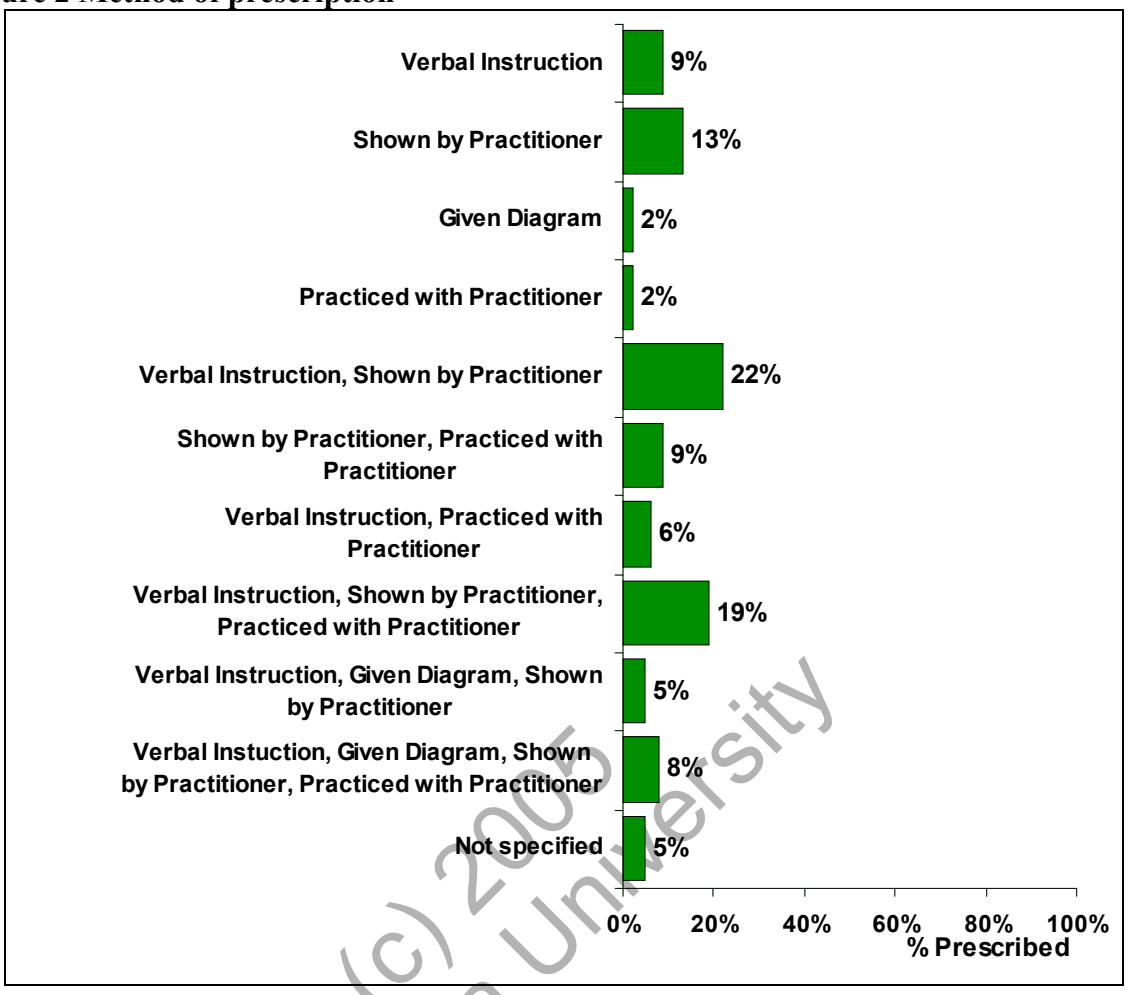

Table 3 Method of prescription that is most compliant

Method used to prescribe	Compliance n(%)	
	Yes	No
Verbal Instruction	2(33%)	4(67%)
Shown by Practitioner	6(50%)	6(50%)
Given Diagram	1(33%)	2(67%)
Practiced with Practitioner	1(100%)	0(0%)
Verbal Instruction, Shown by Practitioner	12(60%)	8(40%)
Shown by Practitioner, Practiced with Practitioner	7(70%)	3(30%)
Verbal Instruction, Practiced with Practitioner	2(40%)	3(60%)
Verbal Instruction, Shown by Practitioner, Practiced with Practitioner	11(58%)	8(42%)
Verbal Instruction, Given Diagram, Shown by Practitioner	6(67%)	3(33%)
Verbal Instruction, Given Diagram, Shown by Practitioner, Practiced with Practitioner	4(67%)	2(33%)
Not specified	3(100%)	0(0%)
TOTAL COMPLIANCE	**55(59%)**	**39(41%)**

Table 4 Compliance rate shown over all exercises

Exercise number	Number of exercises prescribed	Compliance n(%) Yes
1	63	38(60%)
2	23	13(57%)
3	6	3(50%)
4	2	1(50%)
TOTAL	**94**	**55(59%)**

Table 5 Types of prescription being given

Area prescribed?										
Neck	Upper Back	Low Back	Wrist /Hand	Shoulder	Ankle /Foot	Thigh	Hip	Buttock	Cycling	NS
21(22%)	10(11%)	18(19%)	4(4%)	13(14%)	2(2%)	7(7%)	9(10%)	3(3%)	1(1%)	6(7%)
Stretch or exercise?										
Stretch				Exercise				NS		
73(78%)				16(17%)				5(5%)		

Note: NS refers to responses where the area prescribed or type of prescription was not specified.