



Original Article

Learning and teaching of patient-centred communication skills in allied healthcare manual therapy students: A systematic review

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A B S T R A C T

Objective: Analogous to medical professionals, allied healthcare manual therapists such as osteopathy, chiropractic and physical therapy/physiotherapy rely on patient centred communication skills to optimise positive outcomes of clinical encounters. The objective of this review is to identify how communication skills are taught and learned within these specific professions.

Methods: CINAHL, AMED, PubMed, ERIC and PsychINFO were searched in April 2018 (search years: inception-2018). Papers were independently selected by two researchers. A narrative synthesis of results was formulated.

Results: Six papers on how patient centred communication skills are being developed in the undergraduate manual therapy healthcare professions were identified. All excluding one paper reported interventions used in undergraduate physical therapy/physiotherapy. The additional paper provided a summary of teaching methods used in undergraduate physical therapy/physiotherapy university programmes across the United Kingdom. Training programmes employed a combination of instruction, modelling and problem-based learning. Only one paper measured the effectiveness of their training to identify if the changes in the students' patient centred communication skills were observable.

Conclusion: There is little evidence to indicate communication skills training is being provided to chiropractic and osteopathy students. However, communication skills training is being provided to physical therapists/physiotherapists and is varied in the types of teaching techniques used, the duration of teaching and the timing of teaching around clinical placements.

Implications to practice

- Implement structured communication skill interventions in allied healthcare education.
- Evaluate communication skill interventions using Kirkpatrick's model.
- Report intervention impact using clinical outcomes and patient satisfaction measures.

1. Introduction

Osteopathy, chiropractic and physiotherapy (physical therapy in the United States) are three manual therapy professions which may be collectively referred to as allied healthcare manual therapies (AHCMT). In Australia, each profession has a minimum university qualification of four years and must be nationally registered with the government authority: Australian Health Practitioner Regulation agency to use their title and practice their skills. Together, these three professions contribute significantly to the primary healthcare industry by providing services within the public, private and non-government sectors [1]. Osteopaths (practitioners only, not osteopathic physicians) alone, are estimated to consult with approximately 3.9 million patients,

amounting to 3 million hours of treatment services, per year in Australia [2]. The evolving role of a primary healthcare practitioner now demands more than just strength in biological sciences and clinical skills, clinicians must also be able to effectively communicate [3]. Advanced communication skills lend themselves to providing patient centred care which ultimately develops a therapeutic alliance between the patient and healthcare practitioner. The process aims to gather, understand and emotionally support the problem/s from the patient's perspective by exploration of the main reasons for the consultation and their concerns about the issue/s, whilst giving consideration to biopsychosocial influences [4,5]. All decisions pertaining to management of the complaint/s are shared, thereby empowering the patient during the recovery process and improving the likelihood of better outcomes and increased patient satisfaction. Analogous to the services provided by medical practitioners, consultations provided by AHCMT professionals also rely heavily on their communication skills in order to optimally facilitate the practitioner-patient interaction, and subsequent outcomes [6].

Better treatment outcomes and experiences for both the patient and health professional rely on effective clinical communication skills for a successful interaction [7]. According to a systematic review on patient centred care and its association with a positive therapeutic alliance by

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Pinto et al. [5], benefits for patients include satisfaction that they have been given the time to be heard and had the opportunity to emotionally express their concerns appropriately within a supportive environment. Consequently, patients have a better understanding of their problems, investigations, treatment options and prognosis. Healthcare practitioners also benefit from this style of practice in that they are able to make more accurate diagnoses and have patients who are more likely to adhere to advice, treatment and management regimes [8].

With a paradigm shift in healthcare services away from clinician-centred, to patient-centred healthcare [9], comes a greater demand for the healthcare professional to meet the ever-expanding expectations and needs of informed and health literate patients [10]. In addition to having the necessary clinical skills to provide adequate problem-based services to patients, the current trend of increasing chronic lifestyle diseases has forced healthcare professionals to ensure 'preventive medicine' practices are routinely implemented also [11,12]. As the scholarship suggests within the medical domain, communication skills are key in this equation, and as a result have increasingly become recognised as a core clinical skill in healthcare education programmes [13].

Whilst the medical profession began comprehensively overhauling their education programmes more than two decades ago to include the structured learning and teaching of communication skills using problem-based and experiential learning focussed prior to clinical placements [14–16], there is a paucity of evidence in the AHCMT profession literature that any such changes have occurred. In stark contrast to the medical profession where there is an abundance of scholarship exploring the optimal pedagogical practices and evaluation of effectiveness on learners, it appears there has been little published literature on this topic in AHCMT.

1.1. Research aims

This project aimed to explore the approaches and outcomes of communication skills training and its delivery to undergraduate AHCMT students. Undergraduate level education is recognised as the opportune time to lay the foundations for developing students' patient-centred communication skills, prior to any clinical exposure. A systematic review was conducted to identify studies detailing communication curriculum interventions to AHCMT students, to pinpoint educational approaches which have been shown to improve development of patient centred communication skills.

2. Methods

Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [17], for guidance to structure and inform the reporting of the systematic review, a comprehensive search of the literature was conducted to collect published original research answering the question 'How are patient-centred communication skills taught and learned in allied healthcare manual therapy students?'

2.1. Search strategy

The following electronic databases were searched from their inception to March 2018: CINAHL, AMED, PubMed, PsychINFO and ERIC.

No restrictions were used during the initial search process. Shared search subject headings used across all databases were:

- Profession: osteopathy, chiropractic and physical therapy/physiotherapy
- Education: student, curriculum design, learning, university,
- Communication: skills, training, verbal/non-verbal

Each theme was searched using OR, and then combined with the

Boolean AND.

Hand-searching was only conducted on the references of the papers identified as meeting the inclusion criteria at the completion of the screening process. Theses were not considered.

2.2. Inclusion, exclusion and screening

Papers were excluded if they were not written in English, used post-graduate students only, were from health professions other than osteopathy, chiropractic and physical therapy/physiotherapy, the communication skills training was an additional training day/course/workshop, the duration of the training was a once-off occurrence, the initial skills training was delivered in a work-place, rather than a classroom setting, the communication skills were not observed or measured, or the study design was a case study or report. Papers were included if they detailed the type and duration of communication skills training provided to the undergraduate students and the students were studying in the professions of either osteopathy, chiropractic or physiotherapy. There were no restrictions placed on publication dates. Initial searching yielded 490 citations; titles and abstracts were then screened by the researcher (L.M.) and 42 papers were short-listed for 'full-text' examination, as having potentially met the inclusion criteria. Researchers (L.M. and I.S.) examined the full-text citations individually, and differing results as regards to inclusion were then discussed to reach a consensus. A total of three papers were ultimately agreed upon. Hand-searching of the references from the final three papers lead to the inclusion of an additional three papers, therefore data extractions were undertaken on six papers. The full literature search process is outlined in Fig. 1.

2.3. Data extraction and analysis

Researcher (L.M.) extracted a narrative description of the population/student profession, sample sizes, intervention types, duration, study design and conclusions drawn, for all six papers included. Critical appraisal of the quality of papers included in the systematic review were conducted according to criteria outlined by Joanna Briggs Institute [18] and Petticrew et al. [19]. Each paper was scored according to whether or not there was sufficient evidence of the criteria. See Supplementary appendix A for appraisal results. The papers were similarly evaluated for the level of their training intervention according to Kirkpatrick's model of evaluation [20], as outlined in Table 2.

The Kirkpatrick model is an evaluation tool used to measure the impact of training and consists of four tiers: reaction, learning/knowledge, behaviour and results [20]. The first two levels of the model are considered to be the easiest to measure [21], and focus on the superficial concepts of learner satisfaction and any 'shift' in knowledge, skills or attitude [22]. Levels three and four however, are more difficult to measure as their focus is on behaviour change and the effect of behaviour change at the organisational level [23].

All papers in the review revealed a possibility of bias in their design, conduct or analysis. Given that so few papers existed on this topic, it was agreed by the researchers (L.M. and I.S.), that all six papers be included.

See Table 1 for extraction results of all six papers, and Table 2 for critical appraisal of the papers using Kirkpatrick's model.

3. Results

The outcomes of the systematic search to answer the question: 'How are patient-centred communication skills taught and learned in allied healthcare manual therapy students?' (n = 6) are depicted in Fig. 1. Of the six papers used, two were quasi-experimental in design and used pre/post data [24,25], whilst Schulz et al. [26] used a mixed methods approach and collected pre-middle-post intervention data. The three remaining papers [27–29] were cross-sectional in design and collected

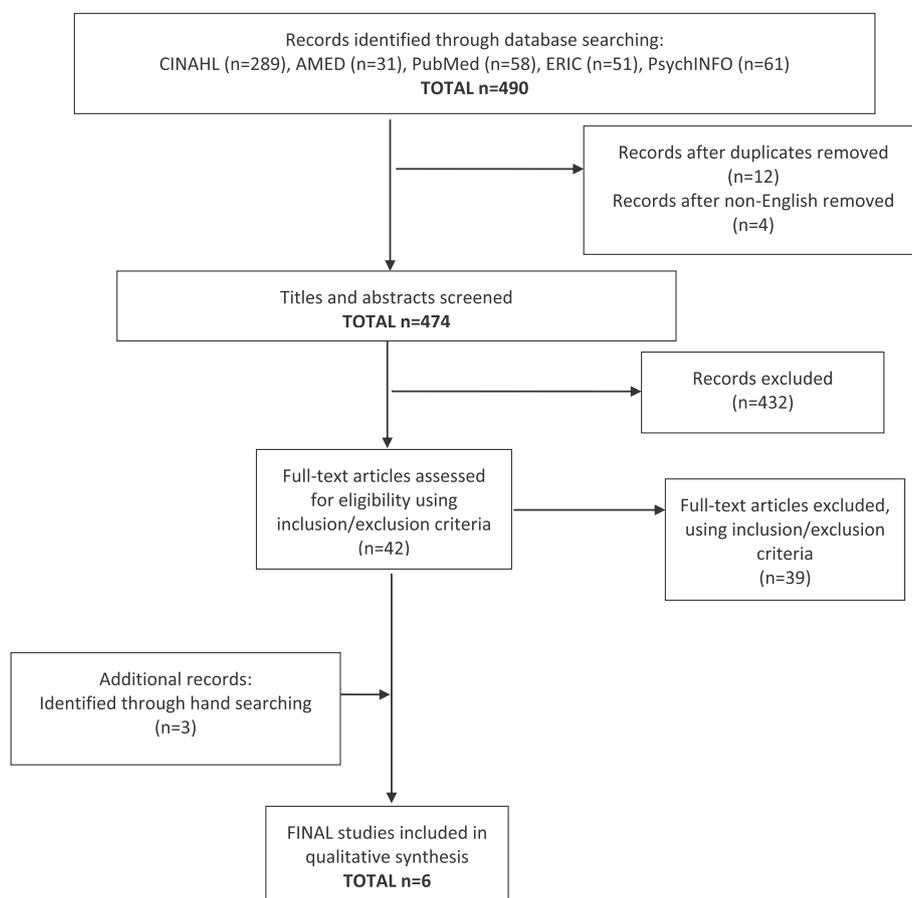


Fig. 1. PRISMA diagram reporting collection and analysis of papers for review.

data post intervention only. In the five papers with interventions, the interventions ranged from no structured educational training [25] to structured micro-counselling, didactic lectures, video recordings with review and feedback, modelling and problem-based learning [24–27,29]. The duration of the communication skill curriculum ranged and progressed from four x 90 min sessions in one year of a physiotherapy programme [25], to 12 h in the first year of a physical therapy programme only [24], to two tutorials, a lecture, a practical class and plenary session weekly, throughout a four year physiotherapy programme [29]. Three studies positioned their communication skills training immediately prior to external clinical placements [25–27]. Sample sizes varied between $n = 26$ [25] and $n = 97$ [26]. Outcomes of reported interventions were measured using student reported measures [25–27,29], coding and scoring of audio transcripts of semi-structured interviews [24], followed by multivariate analysis of variance (MANOVA) and questionnaires evaluating attitudinal change of students toward communication skills training [27–29]. Only one paper indirectly linked their intervention to patient-centred care by measuring patient satisfaction [25]. The earliest papers originated from America and Canada respectively [24,25], whilst two came from Australia [26,29] and one each from Northern Ireland and the United Kingdom (UK) respectively [27,28]. Research on physiotherapy students dominated the included studies, with no papers identified for the other two professions: osteopathy or chiropractic. Payton [24], investigated changes in communication skills of qualified physical therapists and undergraduate first year physical therapist students, two studies ($n = 2$) sampled final year physiotherapy students [25,29], another third year students [26], and one study followed students during the second through fourth years of their programme [27]. Parry and Brown [28] alternatively, surveyed and collated communication curriculum characteristics of university programmes in the UK; still

within the physiotherapy field. A descriptive synopsis of results for all six studies, are presented in Table 1.

4. Discussion

This study aimed to critically review how communication skills learning and teaching is currently provided to undergraduate AHCMT students to develop their patient-centred communication skills.

The results are complicated by the poor reporting of the methodological processes and the validity and reliability of the outcome measuring tools used. They illustrate there is not any published evidence to clarify how communication skills training is delivered to undergraduate osteopathy and chiropractic students, and that a dearth of evidence exists to clarify how physical therapists/physiotherapy students are taught, and subsequently develop their patient-centred communication skills. However, the interventions summarised in Table 1, do reflect the medical literature about learning and teaching communication skills within the wider healthcare professional community [30–33].

4.1. Structured versus non-structured

Three papers measured pre/post intervention status of their sample populations. Levin et al. [25] conducted a pre-test/post-test intervention with comparisons drawn between group one who received structured communication skills training, and group two who did not. Data was collected from observations, student reflection and patient satisfaction. Statistical analysis of variance (ANOVA) to the interview data revealed the effectiveness of the interviewing skills of group one, to significantly improve according to post-test data. Additionally, students reported improved student confidence, better interview control and greater satisfaction for both them and their patient throughout the

Table 1
Descriptive synopsis of results.

Authors (Location)		Intervention										Results	
Profession (Sample size)	Didactic	Small Group	Role-play	Video tapes and feedback	Clinical placement	Content (Number of hours)	Design (Study points)	Data collection method (Statistical analysis)	Outcomes: Patient centred communication	Student perceptions			
Payton (USA) (1983) [24]	✓	N/A	N/A	N/A	N/A	Basic communication skills (closed/open questions, minimal encourager, paraphrasing, reflection of feeling, summary) (20 h)	Quasi (Pre-post)	Semi-structured interviews (MANOVA analysis)	No significant changes in treatment, subjects, skills or focus	Not reported			
1st year student physiotherapists [36]	✓	✓	N/A	N/A	N/A	Interpersonal communication skills + basic communication skills (closed/open questions, minimal encourager, paraphrasing, reflection of feeling, summary) (2 + 10 h)	Quasi (Pre-post)	Written responses to case scenarios (MANOVA analysis)	Undergraduate students demonstrated significant change in their overall use of communication skills (p < 0.0001) for pre-test to post-test and significantly increased their use of open questions (p < .056) and closed questions (p < .0001), paraphrasing (p < .0001) and reflections of feelings (p < .0008). The effectiveness of interviewing skills significantly improved from the pre-test situation. Significant improvement in self-evaluation questionnaire	Not reported			
Levin and Riley (Canada) (1984) [25]	✓	✓	✓	✓	N/A	Basic communication skills in interviewing (4 × 1.5 h)	Quasi (Pre-post)	Observation, Student Reflection, Patient Satisfaction (ANOVA analysis)	Greater confidence in communication with patients	Group 1 students reported: Greater confidence in communication with patients			
Final Year Student Physiotherapists [13]	✓	✓	✓	✓	N/A	None (0 h)	Quasi (Pre-post)	Observation, Student Reflection, Patient Satisfaction (ANOVA analysis)	Greater satisfaction in being able to take a thorough case history	Better control of interview overall			
Final Year Student Physiotherapists [13]	N/A	N/A	N/A	N/A	N/A	None (0 h)	Quasi (Pre-post)	Observation, Student Reflection, Patient Satisfaction (ANOVA analysis)	Control group - no outcomes reported	Not reported			
Schulz et al (Australia) (1988) [26]	✓	✓	N/A	N/A	✓	Basic communication skills and interpersonal helping (10 × 1.5 h)	Mixed methods (Pre-middle-post)	Interviews with students; self-reported ratings; program evaluation; pre-post questionnaire (Analysis N/A)	Effectiveness on improvements in patient-centred communication were not directly evaluated	Not reported			
3rd year student physiotherapists (97 - then divided into smaller groups of 8)	✓	✓	✓	✓	✓	Basic communication skills (4 × 1 h + 4 × 3 h)	Cross-sectional (Post)	Questionnaire (Analysis N/A)	Effectiveness on improvements in patient-centred communication were not directly evaluated	Not reported			
2nd year student physios [39]	✓	N/A	✓	✓	N/A	Basic communication skills (4 × 1 h + 4 × 3 h)	Cross-sectional (Post)	Questionnaire (Analysis N/A)	Effectiveness on improvements in patient-centred communication were not directly evaluated	However students had more positive attitude Yr. 4 > Yr. 2; Students lack insight into the application of communication skills to other assessment tasks during their university education			
3rd year student physiotherapists [44]	✓	N/A	✓	✓	N/A	Basic communication skills (4 × 1 h + 4 × 3 h)	Cross-sectional (Post)	Questionnaire (Analysis N/A)	Effectiveness on improvements in patient-centred communication were not directly evaluated	Whilst students were able to identify communication as a key skill			
4th year student physiotherapists [40]	✓	N/A	✓	✓	N/A	Basic communication skills (4 × 1 h + 4 × 3 h)	Cross-sectional (Post)	Questionnaire (Analysis N/A)	Effectiveness on improvements in patient-centred communication were not directly evaluated	physiotherapists require, consideration of it being taught, and therefore learned, had not been contemplated			

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Table 1 (continued)

Authors (Location)	Intervention	Didactic	Small Group	Role-play	Videotapes and feedback	Clinical placement	Content (Number of hours)	Design (Study points)	Data collection method (Statistical analysis)	Results
Parry and Brown (UK) (2009) [28]	Physiotherapy professionals [25]	✓	N/A	✓ (7 only)	✓ (7 only)	N/A	Communication training (Unknown)	Cross-sectional (Post)	Questionnaire (Analysis N/A)	Outcomes: Patient centred communication Effectiveness on improvements in patient-centred communication were not directly evaluated
Skinner et al (Australia) (2016) [29]	PBL program: 4th year student physiotherapists [42]	✓	✓	✓	✓	✓	Basic communication skills, interviewing skills, interpersonal skills and group dynamics (Weekly lecture x1, tutorial x2, practical x1, plenary session x1 throughout program)	Cross-sectional (Post)	Questionnaire (Analysis N/A)	A significant difference between the 2 groups reported Not reported
	Traditional program: 4th year student physiotherapists [16]	✓	N/A	N/A	N/A	✓	Basic communication skills, interviewing skills, interpersonal skills and group dynamics (Weekly lecture x1, tutorial x2, practical x1, plenary session x1 throughout program) (Unknown)	Cross-sectional (Post)	Questionnaire (Mann-Whitney U Test)	A significant difference between the 2 groups reported Not reported

KEY: Not applicable N/A.

consultation process. Payton [24] alternatively, who used semi-structured interviews and written responses to case scenarios as the outcome measures to their communication intervention found no significant changes in treatment, subjects, skills or focus with the physiotherapy group, but measured a significant change in the overall communication skills of the undergraduate students. These findings are not dissimilar to other papers exploring similar concepts [16,33,34]. As Aspegren [35] commented, not all communication skills are learned spontaneously, and therefore should be taught in order to optimise the clinical encounter for both the practitioner and patient.

4.2. Instructional interventions

All five original research papers [24–27,29] and Parry et al. [28] university questionnaire synthesis, reported on the use of instructional interventions such as didactic lectures, micro-counselling, self-guided and on-line learning. Traditionally these teaching strategies have predominantly relied on the use of written and oral presentation of information [34]. The scholarship suggests however, that whilst these methods are useful for distributing large amounts of theoretical knowledge, their value to developing long lasting communication skills can be overestimated [36]. As Aspegren and Longberg-Madsen [35] noted, some communication skills may be acquired via traditional educational methods, whilst others are not and nor do they subsequently develop with clinical experience. In Evans et al.'s project [37] a comparison of teaching methods was explored when two groups of students were presented 'history-taking' instructional information in a large class setting. One of the two groups also attended small group skills workshops, whilst the other group did not. The outcomes from this project revealed significant improvements in compiling a case history within the group who attended the workshops, when compared with those who did not. Whilst unfortunately, there was no further follow-up to compare their effectiveness long-term in Evans et al.'s project, their findings do contribute to the perception that instructional interventions alone, are not effective in improving communication skills.

4.3. Modelling

Modelling, which was again used by all five original research papers [24–27,29] and referred to by Parry et al. [28] in the practices of teaching methods employed by universities, includes reflection (oral/written), role-play and review and feedback [34]. These types of learning and teaching methods are thought to enrich the students learning experience by better 'marrying' theoretical and practical concepts together [38]. These concepts are further supported by the literature review results from Chant et al. [33] which identified communication skills training was enhanced by active learning strategies such as simulated patients and role play. In addition to the teaching methods included in modelling is problem-based learning (PBL). Whilst a lack of consensus exists regarding the effectiveness of PBL to meet a number of learning needs [39], Skinner et al. [29], was the only paper which employed this model of learning and teaching in addition to those discussed previously. The apparent usefulness of PBL is linked to its long-term knowledge recall and skill performance [39], both of which are extremely valuable to the development of patient centred care communication skills [16,40].

4.4. Intervention timing

Three papers [25–27] sequenced their clinical placement for students immediately following the communication skill interventions. As discussed by Berkhof et al. [30], this too, is thought to significantly impact the retention development and transfer of skills taught. Complicating the sequencing of clinical placements, is the year in which communication skill training commences. As highlighted in the paper

Table 2
Kirkpatrick's Model [20] – Evaluation of level of change.

	Reported [1]	Not reported (0)
Level 1 – Reaction	B	A
	C	E – N/A
	D	
	F	
Level 2 – Learning: Demonstration of skill	A	E – N/A
	B	
	C	
	D	
Level 3 – Behaviour: Use of skill in a 'real' clinical environment	F	
	A	D
	B	E – N/A
	C – used simulation	F
Level 4 – Results: Outcome measurement by patient	B	A
		C
		D
		E – N/A
		F

TOTAL = 4.

A [24] = 2.

B [25] = 4.

C [26] = 2.5 (used simulation).

D [27] = 2.

E [28] = Not applicable (N/A).

F [29] = 2.

by Aspegren [16,40] dilemma exists around where clinical communication skill education is best positioned within a programme, and whether it is pedagogically sound that the theory be provided in one part, whilst the practical application be offered in another. Kurtz et al. [38] suggest the theory may be given in the first year or two of the curriculum, to allow time to provide foundation knowledge in discrete parts, whilst Pfeiffer et al. [41], argue that without the opportunity for practical application, the knowledge and 'maturity' of the students' skills decay. Duration and frequency of the curriculum are also considered to impact on student skill development, yet the scholarship is scant in this area [16,40]. Swadi and Graham [42] for example, compared two communication skill interventions (six hours and 40 h) and discovered that those from the 40 h course did not out-perform the other group and concluded that 40 h was insufficient. The lack of literature supports the diverse range of results observed in Table 1, around these domains.

4.5. Kirkpatrick's model

In consideration of Kirkpatrick's model [22], Levin et al. [25] was the only paper to explore beyond level three, by the inclusion of seeking patient satisfaction indicators. Levin et al. [25] made attempts to measure whether the intervention had resulted in 'real' change to the students, and if it was observable. Payton [24], and Schultz et al. [26] explored the demonstration of skill in the clinical environment, but Schultz et al. used simulated patients, rather than actual patients undergoing treatment. Payton [24] was the only paper who did not report on student satisfaction about the training, which is Level one (reaction) of the model.

4.6. Patient-centred care

Only one paper [25] indirectly linked their communication skill intervention to patient-centred care, by assessing patient satisfaction. Historically, the healthcare professions have mirrored the practice habits of the medical fraternity, which have 'practiced' the practitioner centred model [43]. Combined with the biomedical model, these formed the 'traditional' consultation process whereby the relationship

was unequal, and physicians made decisions on behalf of the patient, and what they thought was 'best' [44]. However, in the last 30 years, there has been a 'shift' toward the effective practice of the biopsychosocial model whereby the patient and all aspects of their healthcare needs are central to the consultation process [8]. The benefit to the change in focus has been shown to be mutually beneficial to both the practitioner and patient [7]. Although the other papers included in this review did not illustrate links between better communication skills and optimal treatment outcomes, the literature certainly suggests, it is a desired, and natural consequence of the process [8].

4.7. Implications to research

It has been made evident by this review that the literature pertaining to the development of patient centred communication skills in undergraduate AHCMT professions is severely lacking. The current scholarship does not allow for replica studies due to insufficient documentation about the interventions and poorly specified outcome measures. We recommend that future studies be conducted and documented with consideration of appropriate design quality to address issues of bias. Future studies should also include evaluation of communication curriculum interventions using Kirkpatrick's model to demonstrate the effect on student participants at the 'reaction' level up to impact on patient satisfaction (results) at the top. Future research in this area may also be useful to facilitate bench-marking of communication skills within discipline specific university programmes and across professions.

4.8. Strengths and limitations of this review

One strength of this review is that it has brought to the forefront the scarcity of scholarship available for undergraduate manual healthcare professions: osteopathy, chiropractic and physical therapist/physiotherapy. This review has summarised the current learning and teaching methods employed to develop patient centred communication skills in undergraduate physical therapists/physiotherapists and compared them with the abundant literature available in medicine.

Limitations to this review include the limited number of papers identified for inclusion in the review, and secondly their associated low-quality methodology. The included papers failed to adequately discuss the implications and impact on results of factors such as the differences of age, education and experience within their profession samples. There was a lack of rigour linked to the tools used to measure the outcomes of the interventions and only one paper explored the depth of skill development by exploring patient satisfaction. Given these issues, it was not possible to confidently answer the question originally proposed, nor make recommendations on the inclusion of any specific learning and teaching methods if establishing a new curriculum.

5. Conclusion

There is description in the literature of communication skills training being provided to physical therapists/physiotherapists. The effectiveness of the communication skills training is more difficult to surmise as critical appraisal of the existing published work scored lowly. In addition, there is no reported evaluation of communication skills learning and teaching in chiropractic or osteopathy programmes. A combination of instruction, modelling and PBL appeared most likely to provide students the opportunity to retain, develop, recall and implement their skills beyond the initial learning period. There is an urgent need for evaluation research of communication skill development and their subsequent impact on outcome measures and patient satisfaction in undergraduate chiropractic and osteopathy programmes.

5.1. Practice implications

There is a dire need to implement structured communication skill interventions, rather than simply relying on learning from behaviour modelling in the undergraduate professions of osteopathy and chiropractic. Communication skill interventions need to be evaluated using Kirkpatrick's model, and subsequently reported on, with the focus to ultimately improve patient outcomes. Having access to such literature from undergraduate AHCMT professions will broaden the scope to benchmark these skills across universities and professions. It is recommended that the design of any future communication projects consider the literature available in the medical domain as a guide, regarding the types of learning and teaching, their sequencing in the programme, the duration and the level of effectiveness the intervention is aiming for.

Conflicts of interest

The authors have no conflict of interest that are directly relevant to the content of this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijosm.2019.04.002>.

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