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Hand health for all: do undergraduate occupational therapy hand curricula respond to the call?

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ABSTRACT

The call for higher education curricula to be responsive to the South African context is growing louder. Injuries to the hand are common in South Africa and intervention is often provided by novice occupational therapists who may work in complex practice contexts with limited supervision. Comprehensive hand health practice addresses both the biomedical and occupational dimensions of the human hand. Undergraduate education programmes should be responsive to this reality in preparing graduates adequately for hand practice. This article describes the content of hand curricula within occupational therapy undergraduate programmes in South Africa with the purpose of considering how they prepare graduates for the practice realities they may face during community service.

A descriptive cross-sectional survey design was used with an online questionnaire aimed at determining the nature and extent of hand curricula presented in South African undergraduate occupational therapy programmes (n=8). Data were analysed using Stata 12.

Time allocated to hand impairments varied considerably across universities. While assessment of biomedical performance components were taught by all universities, the occupational perspective was limited. The range and number of hand conditions and treatment modalities that were taught also varied.

Findings are discussed against the contextual realities of practice in South Africa, primary health care policy, and national and international minimum standards for the education of occupational therapists. Core aspects of a hand curriculum are proposed as a means to enhance comprehensive hand health practice.

Key words: Hand practice, occupational therapy education, hand health

INTRODUCTION

A key milestone towards "eliminate[ing] poverty and reduc[ing] inequality by 2030"[1:14] is providing "affordable access to quality health care while promoting health and wellbeing"[1:24]. One initiative to improve the quality of health care is "increase[ing] the quantity and quality of health professionals to meet local needs"[2:35]. While substantial inroads have been made towards increasing the number of graduating health professionals in South Africa, questions as to whether graduates are receiving the necessary education to meet the health care needs of the population have been raised[3-7]. This article addresses this question in relation to occupational therapy graduate preparedness to meet the needs of people with hand impairments during their Community Service (CS) year. CS is a year of compulsory public sector practice undertaken by graduating health care professionals in South Africa. They are required to complete this year of service before being able to register as independent practitioners and work in settings of their choice. The article reports one aspect of a larger study that investigated the extent to which community service occupational therapists are equipped to treat patients with hand impairments. The larger study, parts of which have been published previously[8,9], captured aspects of the general practice experience of the 2013 Community Service occupational therapists, as well as their perceived preparedness for treating patients with hand impairments.

Although hand injuries are common globally[10], South African data is limited. Considering that two of the four contributors to the quadruple burden of disease potentially include conditions involving the hand, namely trauma and injuries and non-communicable diseases, it is likely that prevalence is relatively high. Studies suggest that violence-related and workplace injuries constitute a noteworthy burden in South Africa[11-14]. The high manual labourer population is likely to contribute to this burden considering the risks of sustaining hand impairments. Although prevalence data is limited, it is reasonable to suspect that the impact of hand impairments on rehabilitation services in South Africa is likely to be significant[14].

Hand services within the South African health system may be provided in community health clinics, linked to basic orthopaedic surgery at secondary facilities and at large tertiary clinics with specialist hand surgeons, although the latter are generally available only in larger cities. Patients treated at tertiary level may be referred to secondary or primary levels of health care for further rehabilitation once specialist treatment is complete. As a result, occupational therapists employed at all levels within the health system may be tasked with providing services to patients with hand impairments. Therapists at tertiary level have the advantage of being able to develop expertise in this area due to the greater number of patients with hand impairments and the availability of more experienced health professionals, while those at secondary and primary level

are required to be generalists and may have limited exposure to colleagues with experience in this area. Generalist occupational therapists require a range of knowledge and skills to deal with the multiple health conditions they may encounter; hence the acquisition of specialist knowledge is challenging.

A further concern is the bias towards the private sector and the largest two provinces (Gauteng and the Western Cape) as reflected in the 2015 membership figures for the South African hand surgery and therapy societies[15-17]. A review of these figures revealed that 86% of hand surgeons and 75% of therapists worked in the private sector with a few working across sectors. Hand surgeons were located in five of the nine provinces, and almost 80% of listed surgeons and 67% of therapists practiced in Gauteng and the Western Cape – the most urban provinces. This situation is alarming considering that 52% of South Africans live rurally[4] and more than 70% are unable to access private health care[18]. As there is no data on health professionals providing hand services who are not members of these societies, or for generalists who treat hand impairments, it can only be concluded that health professionals with a special interest in treating hand impairments are predominantly urban-based and employed in the private sector. They also may, or may not, represent those with experience and expertise in this area, although de Klerk[19] reported that more than 90% of therapists with more than five years' experience in hand rehabilitation[a] worked in the private sector. Furthermore, within the broader study in which this article is situated, CS occupational therapists confirmed the limited availability of hand surgery services and hand rehabilitation expertise in rural and underserved areas of South Africa[8-9]. It can therefore be surmised that many patients requiring this expert service are unlikely to be able to access it, and that services for the majority of the population fall predominantly to novice and inexperienced therapists such as CS occupational therapists.

CS occupational therapists also reported treating a range of health conditions including those to the hand which they reportedly see regularly (median: 20 per month; range: 0 to 225 per month)[8-9]. Conditions treated most frequently included bone and joint conditions, arthritic conditions, thermal injuries, tendon injuries, complex injuries, infections and peripheral nerve injuries[8-9,19-20], many of which are caused by accidents or injury implying a significant need to refocus services towards prevention and promotion. Therapists use a variety of treatment modalities with home programmes, manual therapy, exercise, activity as a means/end, training in activities of daily living, strengthening and education being used most regularly[8-9]. Others, such as splinting, were used less frequently partly due to a lack of resources[8-9].

In upper income countries such as America, hand therapy is considered a specialist area requiring advanced continuous professional development[21]. Anecdotal evidence suggests that many South African occupational therapy educators and clinicians similarly perceive this as a specialised area of practice, as do some novice occupational therapists[22]. The reality is however, that CS occupational therapists are required to treat a range of health conditions, including those related to the hand, often without adequate equipment, appropriate work areas and access to up-to-date evidence[8-9]. The situation is exacerbated by limited supervision from experienced colleagues and few opportunities for continuing professional development activities related to hand rehabilitation[8-9]. The lack of support and infrastructure along with the magnitude of the problems CS occupational therapists face in the area of hand rehabilitation may evoke contrasting emotions, for example feeling overwhelmed (42%) and feeling enthusiastic (48.4%), about this area of practice[8-9,23]. CS occupational therapists encounter the additional challenge of communication difficulties, partly due to language discordance between patient and therapist, which may lead to a loss of meaning and therapeutic properties of the therapeutic relationship with the client which posed a hindrance to therapy[8-9, 23].

Acknowledging the contexts within which CS occupational therapists work and the services they are expected to deliver, it is critical to question whether the content of undergraduate occupational therapy programmes is appropriate and directed at meeting the needs of people with hand impairments in South Africa. Considering that the South African health system is based on a primary health care approach (PHC), occupational therapy curricula should reflect this approach. But what does this mean? With its strong health equity focus, a PHC approach entails preparing graduates to deliver services to people with limited or no access to hand health services and that such service be available to all. To enable graduates to develop the competencies required for providing hand health services, university curricula must prepare them for promoting hand health[b] (for example, promoting mothers' ability to fulfil their roles effectively during the peri-partum period when they are at risk of developing carpal tunnel syndrome and De Quervain's tenosynovitis), preventing hand impairments (for example, preventing hand injuries in factory workers or farm labourers at risk of degenerative, repetitive strain or traumatic hand conditions), and for curative and rehabilitative services to enable clients with hand impairments to achieve optimal health and well-being. A PHC approach suggests that occupational therapy students should learn to identify the social and occupational determinants of compromised hand health in order to provide contextually relevant interventions. Greater insights into the social and occupational determinants of hand impairments should also lead to occupational therapists taking a more active role in prevention and health promotion campaigns, for example raising awareness about unsafe working conditions that result in hand injuries. Preparing graduates to practice within a PHC framework thus suggests that hand curricula be positioned within a vision of hand health for all. In addition an occupational perspective would ensure that students consider the total being in his or her lived reality[24].

Amongst other implications, it also mandates that graduates are prepared to develop and deliver services that are accessible to all South Africans and appropriate for diverse clients from diverse contexts. Extrapolating from the international and national Minimum Standards for the Education of Occupational Therapists documents[25,26] to hand curricula, apart from considering the philosophical applications of a curriculum as a whole, is challenging. However, key concepts need to be considered as a backdrop for preparing graduates for comprehensive hand practice.

The 2016 revision of the World Federation of Occupational Therapists (WFOT) Minimum Standards document shows a major shift "…beyond education on bodily dysfunction" to "help[ing] populations, communities and individuals to live well"[25:11]. Social justice, occupational justice and equitable access to occupational therapy services also feature strongly. Local standards task undergraduate curricula with developing competent entry-level occupational therapists able to develop and deliver culturally and contextually relevant services to promote health, wellness and occupational justice for those at risk of occupational dysfunction[26]. The purpose of South African programmes is to graduate occupational therapists who have a robust understanding of the relationship between occupational engagement and health, and the impact of the environment on this relationship.

The capacity of curricula to develop therapists who are life-long learners, are sensitive to culture and diversity, and who pursue

[a] Hand rehabilitation refers to occupational therapy intervention for individuals, groups or communities with injuries or conditions affecting the Within hand therapy/rehabilitation, the upper quarter refers to the entire shoulder girdle and upper limb. For the purposes of this article, hand rehabilitation is preferred over hand therapy, which may suggest a postgraduate qualification.

[b] The term hand health is used in this article to indicate a comprehensive approach to health service provision and a specific shift in emphasis to include promotion and prevention, in line with a PHC approach.

occupational justice in practice are described as fundamental characteristics. Core content includes knowledge of anatomy, physiology, human movement, clinical sciences, human behaviour and the social environment, PHC, health promotion and community development, research and an understanding of occupation and occupational therapy. The latter relates to the person-environment-occupation transaction and its relationship to health, therapeutic and professional relationships, the occupational therapy process and professional reasoning and behaviour[26]. Core practice content includes exposure to a comprehensive range of services and the use of individual, group/community and population approaches. A relative shift from individual-based intervention to population-based approaches is similarly reflected in the WFOT guideline along with the need for curricula to be both contextually responsive and anticipatory[25]. Exposure to diverse practice settings, and diverse clients, at risk of, or with acute or chronic health impairments is required. Interventions are to be directed at the person (singular or plural), the occupation, and the environment, with activity or occupation constituting the primary mode of intervention[26]. There is also a need to further delineate between undergraduate and postgraduate hand rehabilitation competencies with cognisance of the contextual demands on novice therapists in South Africa, the clinical reasoning capacity of undergraduates, and curriculum resources (for example, time and practice learning opportunities). The vision of hand health for all finds echo in the international and national Minimum Standards documents, yet current practice is skewed towards curative and rehabilitative services despite the adoption of the PHC approach in 1994[27] and the call for an occupational focus[24].

A further consideration for practice and education within this area, is implementing evidence-based practice. Applying research findings from international studies is often problematic in South Africa for several reasons. Intervention approaches proven to be effective in developed contexts do not necessarily demonstrate more favourable outcomes in South Africa. For example, a study comparing the outcomes of flexor tendon rehabilitation protocols at a large urban hospital in South Africa, found similar results between early passive and early active mobilisation protocols[28]. Where the latter protocol has shown better outcomes globally, "non-compliance" (or the impact of complex contextual features in South Africa) was proposed as one of the reasons for the similarity in outcomes between the protocols. Similarly, another study on the same population of clients with flexor tendon injuries reported outcomes that were poorer than those reported in developed nations[29]. Understanding the nature and cause of these kind of discrepancies is critical to developing responsive curricula.

From a review of available evidence, hand rehabilitation services in South Africa appear skewed towards the private sector and urban provinces. It is clear that preventable trauma-based injuries are common, and hand rehabilitation services, despite being considered a specialist area of practice, are being delivered by novice occupational therapists in challenging environments. International and national standards for curricula should be used to inform and evaluate hand health content within the context of the overall curriculum. This article describes the content of hand curricula within occupational therapy undergraduate programmes in South Africa with the purpose of considering how they prepare graduates for the practice realities they may face during community service. A survey of hand curricula was situated in the larger project to understand the undergraduate preparation that novice therapists had received, and to create context for interpreting their perceived preparedness to treat patients with hand impairments.

METHODS

A descriptive cross-sectional survey design was used with a questionnaire designed to determine the content of hand curricula offered at each of the eight universities providing undergraduate occupational therapy education in South Africa (n=8). Questions explored conditions covered, treatment modalities taught, time spent on various knowledge and skill components, the proportion of students who had hand rehabilitation fieldwork placements and the teaching strategies used. *Table I* on page 6 provides an overview of the survey questions with the rationale for their inclusion.

To strengthen the content validity of the tool, three expert practitioners with more than 10 years clinical or educational experience in this area reviewed the questionnaire. The expert panel commented on the content of the questionnaire in terms of its ability to elicit the information required. Feedback although limited, was discussed with the second author to decide on the changes required. Changes included adding examples of treatment modalities (question 6), and types of injuries (question 7), and increasing the number of examples of learning resources (Question 9). A copy of the survey is available on request from the first author.

The survey was sent with an information sheet to the heads of the occupational therapy departments at the eight universities requesting participation. On permission from the head of department, the relevant staff member co-ordinating the hand curriculum completed the survey which was administered online using Fluidsurveys software[30].

Surveys were allocated a number (1-8) and responses were dissociated from the name of the university. Frequencies and percentages were obtained using IBM Statistics 21.0[31] and responses to open ended questions were post-coded. Ethical clearance for the project was obtained from the University of Cape Town (HREC 551 / 2013).

RESULTS

Responses were received from educators at all universities (n=8). Two responses were initially received from one university where more than one educator involved in the hand curriculum responded. The researcher returned these responses to the university concerned, with the request to integrate them into a single response. This revised response was included in analysis.

Educators had been involved in teaching the programme for a median of 7 years (Range: 2-28). The median time apportioned to hand assessment and treatment was 30 hours (Range: 12-96), with a median of 22 hours (Range: 8-42) allocated to teaching splinting skills. In terms of fieldwork placements, an estimated average of 70% of students were placed in settings requiring provision of hand services, usually curative or rehabilitative in nature[c]. The most important aspects of the curriculum were considered to be assessment (n=5) and basic treatment of conditions (n=4). Educators from two universities considered scientific knowledge, splinting, treatment protocols, clinical reasoning and working with limited resources to be important. Mentioned less frequently (n=1 for each) were contextual and occupational considerations, wound healing, the role of the occupational therapist in the hand multidisciplinary team, specialised treatment modalities, prioritising treatment aims, best practice, the ability to identify when to seek advice, and advocating for clients.

All universities taught performance component assessments with six covering hand function assessment. Half the programmes (n=4) included standardised and non-standardised tests (not specified) and three taught clinical observations of the hand. Few covered patient-rated assessment (n=2) and diagnostic tests (n=1). Educators from two universities made reference to assessing occupational performance.

Details of the conditions covered at the different universities are shown in *Table II* on page 6.

Activities of daily living training, activity as means/end, adaptive/assistive devices, sensory re-education, splinting, and strengthening were taught at all universities (see *Table III* on page 7 for the modalities included in the different curricula).

[c] This could be related to upper or lower motor neuron lesions.

Table I: Questionnaire items

	Question Subject	Response type per item	Rationale for inclusion
1	University	Demographic	-
2	Role in hand curriculum	Descriptive item	-
3	Length of time involved in curriculum (years)	Numerical	-
4	Perceived most important aspect of curriculum	Descriptive item	Elicit expert opinion.
5	Hand assessments taught	Open- ended	Performance tests and outcomes measures were found to be used infrequently by South African therapists in a study conducted by De Klerk[19].
6	Modalities taught	Yes/No response with opportunity to comment	Based on practice analysis completed by American Hand Therapy Certification Commission[32]. Identical tables were included in the CSOT survey to enable association with reported preparedness by CSOTs and whether modalities and conditions were covered in the curriculum.
7	Conditions covered	Yes/No response	
8	Teaching strategies used	5 Point Frequency Scale with opportunity to comment	Teaching strategies extracted from article by Brown, Brown, & Roever[33] on paediatric curriculum within undergraduate education in South Africa.
9	Learning resources used	Open-ended	To determine commonly used teaching and learning resources and mediums.
10	Time spent on splinting	Numerical	To determine if increased time spent on skill development is related to an increase in CSOTs perceived preparedness.
11	Splints students fabricate	Open-ended	To determine splints commonly taught at an undergraduate level.
12	% Students who have hand fieldwork placement	Numerical	Fieldwork experience may significantly contribute to new graduate's sense of preparedness for practice[34].
13	Number of teaching hours spent on hand assessment and intervention	Numerical	To determine if increased time spent on assessment and treatment is related to an increase in CSOTs perceived preparedness.
14	Strategies used to encourage evidence-based practice	Open-ended	Searching for evidence and critical appraisal of research, integration of clinician experience and clients' values are considered important aspects of EBP in UL rehabilitation practice[35].
15	Challenges faced in hand curriculum	Descriptive	To assist in developing understanding of constraints in teaching UL rehabilitation to students.
16	Perception: whether graduates prepared for hand practice	Descriptive	Nayar et al[36] highlight that preparedness for practice needs to be appraised from multiple perspectives including that of the educator.

Table II: Hand conditions covered in undergraduate occupational therapy curricula (n=8) (grey denotes coverage by the university)

Hand condition	University							
	1	2	3	4	5	6	7	8
Amputations								
Arthritic conditions								
Bone & joint injury / condition								
Central nervous system disorders								
Complex trauma								
Congenital condition								
Cumulative trauma								
Dupuytren's contracture								
Infections								
Lymphoedema								
Nail-bed injuries								
Pain related syndromes								
Peripheral nerve compression/disease								
Peripheral nerve injury								
Psychogenic disorders								
Soft tissue injury								
Tendon injuries								
Thermal injuries								
Tumours & cysts								
Vascular disorders								

Table III: Modalities covered in undergraduate occupational therapy curricula (n=8) (grey denotes coverage by the university)

Modality	University							
	1	2	3	4	5	6	7	8
Activities of daily living training	■	■	■	■	■	■	■	■
Activity as means / end	■	■	■	■	■	■	■	■
Adaptive / assistive devices	■	■	■	■	■	■	■	■
Appropriate paper-based technology	■		■	■		■	■	
Assessment: non- / standardized	■		■	■	■	■	■	■
Behaviour management			■	■	■	■	■	
Compressive therapy	■		■	■	■	■	■	
Desensitization	■			■	■	■	■	■
Education	■	■		■	■	■	■	■
Electrical modalities								
Ergonomic modifications	■		■	■	■	■	■	■
Exercise	■	■	■	■	■	■	■	
Home programmes	■		■	■	■	■	■	■
Manual techniques	■		■	■	■	■	■	■
Mirror therapy	■				■	■	■	■
Prosthetic training				■	■		■	
Scar management		■		■	■	■	■	■
Sensory re-education	■	■	■	■	■	■	■	■
Splinting	■	■	■	■	■	■	■	■
Strengthening	■	■	■	■	■	■	■	■
Thermal modalities					■	■	■	■
Work retraining	■				■	■	■	■
Wound care				■			■	

Universities covered a range of splints with almost all teaching their students to fabricate wrist extension (n=8), resting (n=7) and dynamic extension (n=7) splints. Refer to *Figure 1* for splints fabricated by university.

The results reflect a wide variation in hand curricula across the different universities.

DISCUSSION AND IMPLICATIONS

The study set out to describe the content of hand curricula delivered in undergraduate occupational therapy programmes in South Africa. This section begins by considering key contextual drivers that should guide hand curricula in order to respond to the needs of the population. The results of the study are then discussed in relation to international (WFOT) and national (HPCSA) minimum standards for the education of occupational therapists and other relevant literature. Recommendations for comprehensive hand curricula for undergraduate occupational therapy programmes are provided in each section of the discussion as illustrated in *Figure 2* on page 8.

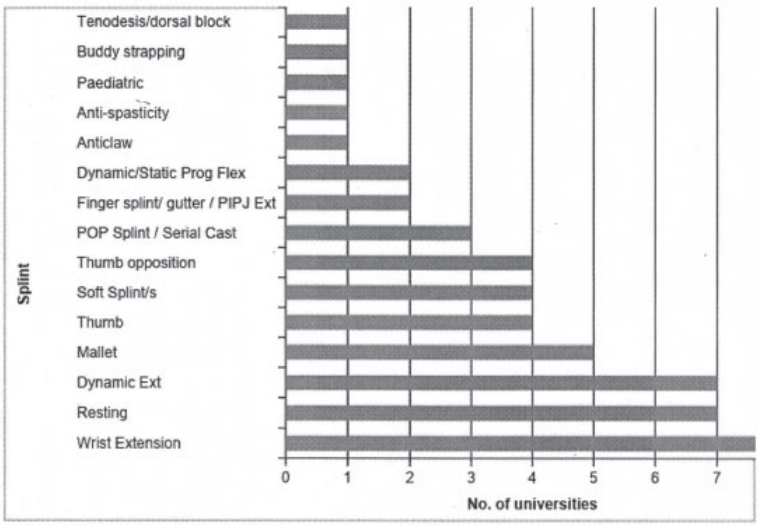

Figure 1: Splints fabricated at each university (n=8)

Contextual drivers

Policy[1] and planning[2] demand that comprehensive hand interventions are both equitable and accessible. International educational guidelines include equitable access to services as a core curriculum principle across all areas of occupational therapy practice[25]. South African educators need to be cognisant of the skewing of current hand services towards the private sector in urban centres[15] and be willing to position curricula to equip graduates to deliver and develop services in rural and underserved areas. This would encompass equipping students with the competencies and characteristics required for working in such contexts[37]. Graduates should be equipped to factor accessibility barriers, such as remote locations, influence of weather, distance to facilities, cost of transportation and various system limitations[38] into their interventions. Policy[1,2] along with local[26] and international educational guidelines[25] speak to the development of hand services that are comprehensive. Graduates thus need to be able to use prevention, promotion, curative and rehabilitative approaches to address the hand health needs of individuals, groups and communities. This would require graduates to be able to identify the social and occupational determinants of compromised hand health and be able

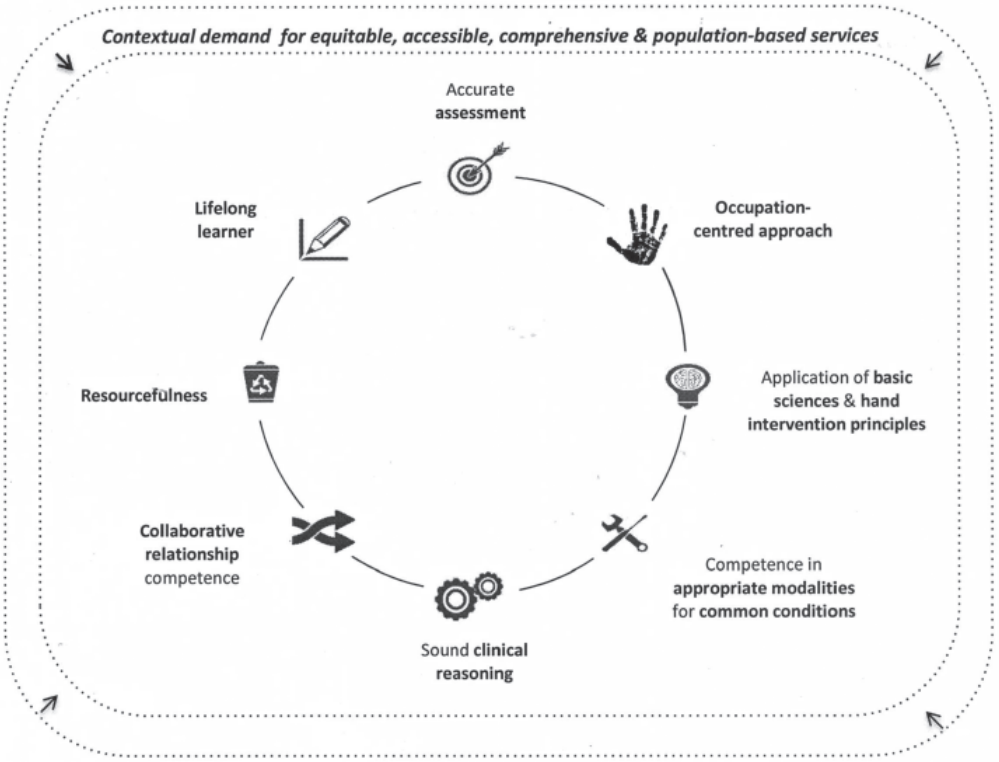

Figure 2: Graduate characteristics and competencies that hand practice curricula should develop

Images: Image of hand print- purchased by first author from iStock Photos (www.istockphoto.com). All other images designed by Freepik (www.freepik.com)

to adopt a population-based approach to hand intervention[1,25]. Furthermore, an occupational view would require a shift in emphasis to the implications of hand impairment on human doing, being and becoming in context[39].

Characteristics and competencies that occupational therapy hand curricula should develop

In addition to being responsive to contextual imperatives, key graduate competencies and characteristics that were evident in educators' responses are discussed with reference to the literature.

Accurate assessment

Educators believed assessment to be the most important aspect of a hand-care curriculum. This perception is shared by American hand therapists who rate assessment as being 'highly critical' to hand rehabilitation practice[32]. For the focus of intervention and modality choice to be appropriate, thorough assessment to discern the nature and underlying causes of clients' problems is required. Accurate assessment will enable novice graduates to understand the problems with which clients are presenting and suggest a point of departure for treatment. Accurate assessment also enables graduates to measure the success of interventions[40] and will assist them in seeking support from colleagues or mentors with experience, as guidance for treatment planning and implementation can be provided if accurate assessment findings have been communicated.

Although educators considered assessment to be important, assessments taught within hand curricula were largely restricted to biomedical performance components, which has been reported as a concern by other authors[19,41]. Only two educators made reference to the assessment of occupational performance and one prioritised contextual and occupational considerations in assessment. This is not surprising as the return to an occupation-based, or an occupation-centred approach to hand practice is a relatively recent trend in the literature, and its implementation in South Africa is perceived as challenging[19]. Given the nature of hand practice, performance component assessment is essential, but may be insufficient. Hand intervention that focuses exclusively on performance components or body structures and functions, suggests a belief that these factors alone affect participation, potentially disregarding clients' occupational needs and goals, their readiness to participate in intervention and various personal and environmental factors[25]. This focus also runs the risk of shifting therapy away from collaborative practice where therapist and client co-author the process, as knowledge of body structures and function often lie with the therapist.

Occupation-centred approach

In describing an occupation-focused approach to practice, international education guidelines state that curricula should "go beyond education on bodily dysfunction"[25:11] and advance participation by considering the occupational and social determinants of health[25]. A robust discussion on what constitutes occupation-centred or occupation-based hand practice is beyond the scope of this article but it suffices to acknowledge that the purpose of South African occupational therapy curricula is to qualify occupational therapists with a comprehensive understanding of the relationship between occupational engagement and health, and the impact of the environment on this relationship[26]. This necessitates an understanding of clients with hand intervention needs as occupational beings, a feature that has been described as essential to occupation-centred curricula[42]. Despite hand therapy practice often being situated within the biomedical model[43], the American Society of Hand Therapists acknowledge the importance of function or participation in daily occupations as a key aspect of assessment[44]. Since the ultimate goal of occupational therapy in hand practice is occupational participation, an occupation-centred approach needs to define both assessment and intervention. Intervention should be directed at the person (group, community or population), the occupation and the environment with activity constituting the primary mode of intervention[25].

Application of basic sciences and hand intervention principles

The holistic focus on occupational participation in occupation-centred hand intervention does not minimise the need to manage

disruption to body structures and functions[25] through the application of sound scientific and hand intervention principles – an aspect of curriculum prioritised by a number of participating educators. Core content of occupational therapy curricula described by the HPCSA includes knowledge of anatomy, physiology, human movement and clinical sciences[26]. Graduates' integration and application of basic sciences and hand intervention principles is thus an essential component of hand practice.

Competence in appropriate modalities for common conditions

Half the educators felt that the basic treatment of conditions is a curricular priority. Conditions covered appear to largely correlate with those that therapists have reported to treat frequently[8-9,19-20] although the incidence of complex and cumulative trauma may suggest that these should be covered by all universities[8-9]. Some conditions (e.g. nail bed injuries) could arguably be omitted due to them being treated very rarely by novice therapists. Frequent modality use reported by graduates[8] correlates largely to modalities taught. This could be a response to contextual need or may be linked to graduates having been prepared to use them. Reported modality use may suggest that home programmes, education and manual therapy should be taught in all curricula. Two educators felt that splinting was a curricular priority, although the relative infrequent use of splinting by South African graduates[8] may challenge how educators include the learning of this skill in curricula. Low-cost splinting approaches are vital and the realities of working in rural and underserved contexts may justify a shift from a focus on splinting itself, to the development of the skill within a sound clinical reasoning approach that is directed by an understanding of clients as occupational beings. The philosophy of the profession prescribes that contextually appropriate activity and occupation remain the primary mode of intervention[26] and contextual resources (e.g. absence/relative absence of surgical services; absence of thermoplastic material) and realities (clients travelling long distances to therapy and attending infrequently) be considered in selecting the modalities that are included in curricula. Competence in appropriate modalities for common conditions should thus also be considered a key aspect of undergraduate curriculum.

Sound clinical reasoning

While 25% of the educators felt that curricula should cover treatment protocols, it is important to note that these may restrict some aspects of practice[45], and in South Africa factors beyond the protocol implementation appear to affect treatment outcomes[28]. Key principles of hand practice are embedded within protocols and may provide critical guidance for graduates with limited experience. However, a multitude of contextual factors (for example absence of hand surgery, late presentation of injuries, complex injuries to multiple structures, infrequent appointments, or role- demands of the client) may also limit the applicability or ease of application of protocols by South African graduates. Sound clinical reasoning, prioritised by two educators participating in the study, may be the key to allowing graduates to apply their undergraduate knowledge to diverse client presentations, drawing from the principles contained in protocols. Graduates with "enhanced clinical reasoning skills" are listed as an essential outcome of curricula in the international minimum standards (extracted from the World Health Organizations Report on increasing the Relevance of Education for Health Professionals, 1993)[25]. Local standards echo this priority in describing graduates who should be able to "interpret complex, unfamiliar and ill-defined situations" and respond creatively to them[26:10]. Developing sound clinical reasoning ability around hand interventions should enable graduates to navigate the complexities of their clients, their environments and their occupations and to provide appropriate intervention. Sound clinical reasoning will enable graduates to cope with unusual or unfamiliar presentations and to consult evidence. It will also prompt them to seek support from supervisors and mentors when necessary and assist them in pursuing best practice – two further curricula priorities educators' highlighted.

Collaborative relationship competence

Only one educator felt that "understanding the client within their context" was a priority in hand curricula, echoing a recommendation from an Australian study that described therapists' appreciation of context in enhancing collaboration and effective communication with clients[46]. The WFOT MSEOTs speak extensively to the concept of 'contextual responsiveness' which involves understanding clients as occupational beings (individuals, groups or communities) within their local context and encompasses appreciating multiple contextual and environmental factors affecting clients' health needs, and health and social systems. Culture is emphasised as it "influences beliefs about the relative importance of various health conditions or threats to health and well-being, as well as perceptions about whether occupational therapy will be helpful…. Cultural beliefs influence local understandings about the relationships between occupation, health conditions and physical, mental, social and spiritual well-being, and therefore influence what occupations are perceived as harmful or helping people."[25:22].

Applying an understanding of clients in their own contexts to intervention plans requires essential soft skills described in the WFOT MSEOTs and include interpersonal relationships, affective sensitivity, communication and political awareness, people-centeredness and collaboration, treating people with respect and building trust, listening actively, communicating effectively, demonstrating cultural sensitivity and determining client readiness for occupational therapy[25,47]. Many of these features resonate with the experiences of new graduates in South Africa who reported the extensive impact of communication difficulties on the quality of hand interventions and the importance of cultural competence[9]. It is thus imperative that hand curricula do not neglect developing collaborative relationship competence in graduates.

Resourcefulness

Two educators felt that one of the most important aspects of hand curricula was equipping graduates to work with limited resources. Resourcefulness, defined as "creativity in the construction or conceptualisation of practical solutions", is described as a required professional behaviour of South African graduates in the HPCSA minimum standards[26:10]. Resourcefulness is arguably an essential skill in the delivery of hand intervention given that 73% of a sample of CS occupational therapists lacked the necessary equipment to treat hand impairments, that hand-injured clients may present late when surgical intervention is no longer possible, and that various other human and non-human resource limitations impact on practice8.

Life-long learning

One educator felt that learning "specialised techniques" for hand intervention was very important. As developing specialised skills requires time, this aspiration is unrealistic at undergraduate level. It does, however, highlight the need to delineate between undergraduate and postgraduate competencies required for hand interventions with due consideration of what context demands of novice therapists in South Africa, the clinical reasoning capacity of undergraduates, and curricular resources (for example, time and practice learning opportunities). Accepting the responsibility for life-long learning is one of the fundamental characteristics of the South African minimum standards for graduating occupational therapists[26] and is thus also a graduate characteristic essential for ensuring competence in delivering appropriate hand services. Two educators reported focusing on the importance of life-long learning in order to develop evidence-based practices in their students. How life-long learners are developed warrants more extensive discussion than can be provided in this article, but strategies may include educators modeling themselves as continual learners, students being required to take responsibility for their own learning, communicating the value of acquiring mentors, and pursuing continuous professional development opportunities.

A further aspect that may drive life-long learning is enjoying the area of practice. Enjoying hand practice emerged as a significant factor in the broader study[8-9], within which this project was situated. A statistically significant association between the university from which a therapist had graduated and whether they felt equipped to treat some hand conditions and use some modalities was noted. These associations could not, however, merely be explained by whether or not the condition or modality was covered in a curriculum or by the number of teaching hours. To develop a profile of a prepared graduate, 25 factors were analysed against competence and confidence, and those with a significant univariate association were included in a logistic regression. Perceived competence, enjoying treating hand clients and having an undergraduate hand fieldwork placement were most significantly associated with competence. Similarly, therapists who reported feeling confident, were more likely to report having adequate skills, enjoying hand practice and having had a hand fieldwork placement. A majority (80.2%) of these therapists also perceived that an improved practical component in undergraduate hand curricula was necessary. Further exploration into how hand practice learning opportunities can creatively be incorporated into curricula and how an enjoyment of hand practice can be fostered is thus required.

This study is the first to report on undergraduate hand curricula offered within South African occupational therapy programmes. It is acknowledged as a limitation that the research instrument was built on a limited review of the literature and underwent limited piloting. Furthermore, the questionnaire may have under-captured latent curricular content impacting on hand curricula, and changes to curricula may have occurred since data collection. The questionnaire focused more intensively on the rehabilitative aspects of practice and may thus have substantially under-captured prevention and promotion approaches within curricula.

CONCLUSION

In a poverty-burdened context, promotion of hand health, prevention of impairment and rehabilitation after hand injury is critical, as is the maintenance of occupational well-being. Appropriate preparation of therapists for this task is important. The mandate of undergraduate hand curricula is not to produce specialised hand therapists, but rather therapists who are able to intervene with people whose occupational health or well-being is being compromised, or is at risk of being compromised by a hand impairment. Graduates need to be able to follow the occupational therapy process with clients with, or at risk of developing, hand impairments. Curricula need to be shaped by local policy and local and international minimum standards of education in order to be responsive to the hand health needs of the population. Various competencies and characteristics are proposed as curricula priorities in order to develop graduates that are able to contribute to the vision of hand health for all.

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