PRACTICE PAPER

Educating Health Professionals about Disability: A Review of Interventions

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Abstract

Health professionals need to understand the human rights and health needs of disabled people. This review of evidence on interventions demonstrates that a range of often innovative approaches have been trialled. Lectures by faculty are less effective in changing attitudes than contact with disabled people themselves. Existing examples of good practice need to be scaled up, and better and more long-term evaluations of impact are required.

Keywords: disability, human rights, attitudes, students

Background

Disability is a social issue, not just a medical one (Shakespeare 2006). But people with disabilities have health needs arising from their primary impairment as well as general health needs (Shakespeare 2012) and sometimes a narrower margin of health (World Health Organization and World Bank 2011). People with disabilities often do feel healthy and can be successful in managing their own health needs if they receive the appropriate support and information (Watson 2002, Nazli 2012). Yet evidence shows that these health needs are not adequately met, due to financial access and attitudinal barriers. Analysis of the World Health Survey showed that people with disabilities were twice as likely to find health care provider skills and equipment inadequate to meet their needs; three times as likely to be denied care; and four times as likely to be treated badly by health care providers (World Health Organization and World Bank 2011). This evidence is reinforced by other

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studies (Aulagnier *et al.* 2005, Dorji & Solomon 2009, Cervasio 2010, Pace *et al.* 2011). Analysis of the 2006 US Medical Expenditure Panel Survey revealed that people with disabilities were more likely than nondisabled people to think that their doctor had not listened to them, treated them with respect, taken enough time, involved them in treatment decisions or explained treatments properly (Smith 2009). In the UK, the Formal Investigation into Inequalities in Health found that people with mental illness and people with intellectual impairments received a worse service from health professionals, which may have contributed to the poorer outcomes they experienced (Disability Rights Commission 2006).

Given evidence of discomfort, negative attitudes and lack of knowledge on the part of health professionals, there is a need to ensure better training and education about disability (Larson-McNeal et al. 2002, Eddey & Robey 2005, Chmar *et al.* 2007, Shakespeare *et al.* 2009, Baker 2011, Iezzoni & Long-Bellil 2012, Wilkinson *et al.* 2012,). Ensuring this is a legal obligation for countries that have ratified the Convention on the Rights of Persons with Disabilities (UN 2006), Article 25 (d) states that States Parties shall:

> Require health professionals to provide care of the same quality to persons with disabilities as to others, including on the basis of free and informed consent by, inter alia, raising awareness of the human rights, dignity, autonomy and needs of persons with disabilities through training and the promulgation of ethical standards for public and private health care.

Bearing this legal standard in mind, the following competencies could be proposed, drawing on Kirschner & Curry (2009):

1. Framing disability within the context of human diversity across the lifespan and within social and cultural environments.
2. Skills training for assessment of disability and functional consequences of health conditions, considering implications for treatment and management.
3. Training in general principles concerning etiquette for interactions with persons with disabilities.
4. Learning about roles of other health care professionals forming integrated teams to care for persons with disabilities.
5. 5 Understanding the legal framework of national anti-discrimination legislation, the Convention on the Rights of Persons with Disabilities, relevant ethical standards, and the principles of reasonable accommodation and universal design.
6. Competency in patient-centred care approaches, including patients' perception of quality of life.

Despite efforts to improve professional education on disability, to date there has been no comprehensive overview. The purpose of this paper is to review what has been trialled and, where known, the outcomes of these trials.

Methodology

Electronic database searches were conducted with MedLine, which produced 1666 possible publications. Titles were scanned and abstracts read, to ascertain relevance. Inclusion criteria: relevance to any aspect of: attitudes of health care workers (students or professionals) towards people with any form of disability; teaching methods used to educate students or professionals about disability; disability curriculum content; or integration of disability teaching into existing curricula. Exclusion criteria: articles that dealt solely with clinical issues and papers solely concerned with improving teaching of rehabilitation sciences.

Results

The search produced 192 relevant articles; 106 of these could be accessed online and downloaded as full texts. 48 of these papers concerned a specific, relevant teaching intervention or evaluation, of which five related to in-service training and the remainder to pre-qualification training.

Geographical spread

The search was limited to studies in English or French. 28 papers described interventions in the USA, 12 in the UK, three in Australia and one each in France, Germany, Hong Kong, New Zealand, South Africa, Sweden, and Switzerland.

Different approaches

A variety of approaches to improving attitudes, knowledge and practice have been trialled, often in combination. Starting with the distinction that Symons *et al.* (2009) make between school-based education, community-based experiences, and clinical experiences, we created a classification based on an inductive analysis (see Figure 1). Typical examples are discussed in the following sections, and the results table (see Table 1) summarizes all the included studies.

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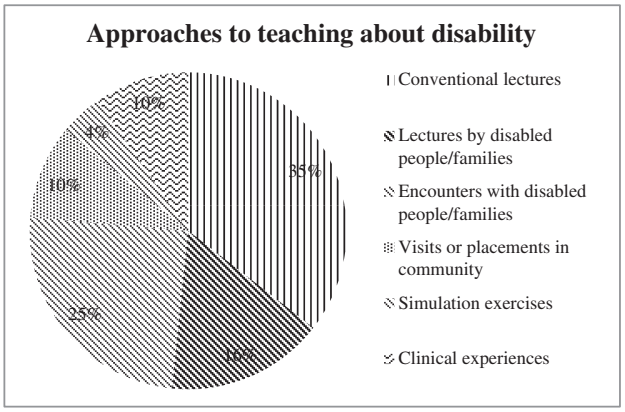

Figure 1 Approaches to teaching about disability.

Conventional lecture or seminar delivered by faculty staff (33 papers)

Teaching on disability is very common. While any training is good, having a few hours teaching about disability is likely to be insufficient to change attitudes, instill required knowledge or develop skills (Richard *et al.* 2005, Delucia & Davis 2009). Rather than simply relying on didactic instruction, experiential learning with reflective components is recommended for training dental students about care of people with intellectual disabilities (Delucia & Davis 2009). Innovative approaches using computer-based training were reportedly effective (Ruiz *et al.* 2006, Kleinert *et al.* 2007) and can be easier to deliver; for example an interactive module featuring a deaf-blind virtual patient (Sanders *et al.* 2008).

Teaching delivered by disabled people or their family members (15 papers)

Hearing from those with direct experience of disability is likely to make more impact and be more memorable. For example, Monash University medical students engaged with tutors with intellectual disabilities on a three-hour communication workshop, which increased their understanding and comfort levels with this traditionally underserved community (Tracy & Iacono 2008). At Leeds University, a series of seminars for medical students on 'valuing diversity' were taught, inter alia, by deaf people, disabled people from the local Centre for Integrated Living, people with mental health conditions and people with intellectual disabilities (Thistlethwaite & Ewart 2003).

Encounters with patients, advocates or standardized patients (23 papers)

Research with dental students shows that prior experience with people with intellectual disabilities is associated with comfort levels in treating this population (Delucia & Davis 2009). Supervised contact has been found to have more impact on knowledge and attitudes than lectures alone, for example in improving confidence in working with people with intellectual disabilities (Adler *et al.* 2005). Home visits are typical (Sharma *et al.* 2006, Mullen *et al.* 2010), and various approaches have been successfully trialled, including inter-professional learning (Street *et al.* 2007, Anderson *et al.* 2010). In a more elaborate US project, family medicine clerkship students conducted a series of interviews with standardized patient educators with disabilities that were videoed and discussed in feedback sessions (Duggan *et al.* 2009). Innovative senior mentoring programmes in South Carolina involved students being paired with an older person to do assignments ranging from clinical assessments to home safety assessments (Corwin *et al.* 2006).

One-off events are another option. In North Staffordshire, the production of a Toolkit to improve health services for people with intellectual disability (ID) (available at www.keele.ac.uk/depts/ns/toolkitpeopleId) was followed by a workshop, partly led by people with ID themselves (Read & Rushton 2012). A US college of medicine organized a panel of senior citizens to interact with medical students (Tandon *et al.* 2011). Before offering vision screening to Special Olympic athletes with ID, 71.5% of volunteer optometry students and professionals lacked confidence; after a day of training and at least two days' contact, nearly 80% were confident or very confident at examining this population (Adler *et al.* 2005).

Virtual engagement has also been attempted. St Bartholemew School of Nursing and Midwifery (London, UK) experimented with an online discussion forum which involved mental health service users educating mental health nursing students in the context of Enquiry-Based Learning (Simpson *et al.* 2008). Service users were supported

Table 1 Summary of included studies.

Citation	Setting	Sample	Topic	Intervention	Lectures	PWD teach	Encounters	Placement	Simulation	Clinical	Outcomes
PRE-QUALIFICATION TRAINING											
Adler *et al.* 2005	Volunteers in Special Olympics training programme	Optometrists and student optometrists (n=90) versus control (n=83)	Vision screening for people with ID	One day workshop and supervised patient contact	x		x			x	Significant improvement in knowledge in intervention group. Greater improvement in confidence to treat among those who had undertaken a day of lectures and at least two days' patient contact than in control group who had only had half a day of lectures as part of continuing education.
Amosun *et al.* 2005	University of Cape Town Medical School, SA	Volunteer medical students (n=2)	Special study module on Images of disability	Five consecutive days in wheelchair					x		Students reported being more senstitised to needs of people with mobility impairments, and significant positive change in attitudes.
Anderson *et al.* 2010	University of Leicester, Leicester DeMontfort University	Students of medicine (n=100), social work (n=50)	Interprofessional education about disability in community	Placement in community hospitals, input from disability advocates.		x	x	x			Evaluation from students strongly positive (90.9% SW, 86.7% Med) on attitudes to disability. Enjoyment of programme (73.2% Med, 74.2% SW). Interprofessional aspect caused some tensions. Service users valued process and enjoyed being educators.
Anderson *et al.* 2011	University of Leicester, Leicester DeMontfort University	Students of medicine, midwifery, nursing, pharmacy, social	Communication skills	One day work shop		**x**	**x**				Focus group and questionnaire evaluation found significant gains in student knowledge,

Table 1 Continued

		work, speech and language therapy (n=109)								very positive evaluation, particularly of meeting service users and hearing their stories.
Berg *et al.* 2008	Pace University, NY	Audiology students (n=19) and controls (n=16)	Lived experience of hearing loss	Use of written narratives (novels, articles, films)	x					Narratives of life with disability appear effective in increasing affective response among audiology students.
Block *et al.* 2005	Stony Brook, NY, USA.	Occupational therapy Masters students	Introduction to disability studies	Lectures, seminars, film, visit to CIL	x	x	x			Ethnographic data suggested students were enabled to take a broader perspective and critically analyze their professional roles. Visit to Centre for Independent Living was challenging, revealing tension between OT and IL philosophies.
Burbank *et al.* 2006	New York Tuskegee Uni, Uni of Rhode Island, USA	Nursing students	Caring for older adults	Varied	x		x	x		x	Strong student evaluations, and some evidence of attitudinal change to older people pre and post intervention (RI)
Corwin *et al.* 2006	University of South Carolina, USA	2nd year medical students (n=36)	Geriatrics	Older person as mentor			x			x	Unequivocal support for programme from students and seniors. Students self-reported changed attitudes and greater awareness of older people.
Crotty *et al.* 2000	Flinders University, Australia	Graduate entry medical students (n=100)	Disability and rehabilitation	4 wk course, incl. visit to patient in hospital and at home & community service	x		x	x	x		96% agreed worthwhile experience, 93% agree relevant to needs. Involvement in inpatient rehab most highly valued. 85% valued the simulation exercise. OSCE measured student ability

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Table 1 Continued

								to assess and manage aspect of disability.
DeLucia & Davis 2009	University of Buffalo School of Dental Medicine	Dental students (n=67)	Care of patients with ID	2 hr initial lecture plus up to 2 hrs other lectures and discussion	x			Less than 4 hrs teaching did not change attitudes or comfort levels. Prior experience with people with ID associated with higher comfort levels.
Denton *et al.* 2009	Uniformed Services University, US	3rd year medical students (n=34)	Geriatrics	Home visit, assessment, presentation of findings	x		x	Knowledge improved similarly in control and intervention arms. General attitude improved (9.8% intervention, 0.5% control), home care training (21.7% intervention, 3.2% control).
Duggan *et al.* 2009	Tufts University, USA	Family medicine clerkship students (n=138)	Caring for patients with disabilities	Video taped interviews with standardized patient educators with disabilities			x	Case designed in consultation with people with disabilities, family members, medical educators. Students able to reflect on their communication with a patient with disability and about patient empowerment.
Fruhauf *et al.* 2004	Virginia Polytechnic Institute and State University	Undergraduates on ageing course (n=16)	Geriatrics	Service learning project at Adult Day Services programme for people with dementia	x		x	Training enhanced benefits of placement with people with dementia and improved interactions.
Gitlow & Flecky 2005	Husson College, Bangor, USA	Occupational therapy students (n=40)	Disability studies, accessibility, disability arts.	Service learning project, work with artists with disabilities	x	x	x	90% students were more comfortable working with clients from different cultures. Greater understanding of need

Table 1 Continued

								for environmental adaptation. Shift from individual to structural understanding of disability.
Graham *et al.* 2009	University of South Carolina, USA	Family medicine clerkship students (n=71)	Clinical issues for patients with disabilities, and accommodations	90 minute teaching session using scenarios	x			Significant reduction in proportion feeling awkward or sorry for people with disabilities, and improvements in knowledge. Subsequently designed Objective Structured Clinical Exams with PWDs.
Jansen & Morse 2004	University of Wisconsin-Eau	Student nurses (n=53 controls, 60 intervention)	Caring for elders	Ageing content integrated across curriculum	x			Significant improvement in attitudes for control (separate ageing course) and intervention (ageing integrated across curriculum).
Jones & Donald 2007	University of Newcastle, Australia	4th year undergraduate medical students (n=26)	Paediatrics	8 week placement in rural special school		x		All agreed placement was a positive experience and gave better understanding of children with special needs. Placement did not increase staff workload and was welcomed by staff.
Karlowicz & Palmer 2006	Old Dominion University, Virginia, USA	Nursing students	Urinary incontinence	Experiential learning			x	Positive feedback over 10 years of the activity, regarding raised awareness and changed attitudes.
Kleinert *et al.* 2007	University of Kentucky	Dentistry students (n=51)	Care for children with developmental disabilities	Interactive, multimedia virtual patient module	x			Pre- and post-intervention knowledge levels improved by almost 60% and the interactive CD ROM was regarded as "needed" and "easy to use" by students.
Markström *et al.* (2009)	Lund University, Sweden	Healthcare profession	Attitudes to mental illness	5 week clinical placement following	x		x	Attitudes towards mental illness in general improved, perhaps due to interaction

Table 1 Continued

		students (n=167)		theoretical course					with people with mental health conditions, but attitudes to specific illnesses did not change.
McClimens & Scott 2007	University of Sheffield	Learning disability nursing students	GP consultation with person with ID	Forum Theatre experiential learning			x		Feedback that session was enjoyable, students became more aware of power relations in medical encounter.
McConville & Lane 2006	University of Wolverhampton	Nursing students (n=145)	Self-efficacy with difficult situations including communicating with patient with ID	Video clips	x		x		No significant difference between information communicated in lectures and by watching video clips, but combination found to be beneficial.
Moroz *et al.* 2010	New York University	Residents in physical & rehab medicine (n=11+10 controls)	Knowledge and attitudes towards people with disability	Day long curriculum involving multiple formats	x	x		x	Significantly increased knowledge and better attitudes over controls. While three months post test found reversion to former levels of knowledge, attitude improvements persisted. Personal stories of PWD were found to be most beneficial.
Mullen *et al.* 2010	University of Glasgow	1st year medical students (n=227	Impact of long-term illness	Life History interviews with patients in own homes			x		Feedback showed improved knowledge and attitudes about impact, context, and dynamics of chronic illness, but limited gains in understanding of research methods.
Nitschke *et al.* 2009	Leipzig and Zurich Universities	Undergraduate dental students	Dentistry with older persons	Extramural clinical activities	x		x	x	Participation in Zurich MobiDent service treating seniors in care homes was strongly valued and led to reduced pity for patients.
Ruiz *et al.* 2006	University of Miami, USA		Dementia	Computer based training	x				Improvements in knowledge, self-efficacy and attitudes

Table 1 Continued

		Nursing students (n=38)		tutorial (4 hours total)				towards patients with dementia.
Read & Rushton 2012	University Hospital of North Staffordshire, UK	Nursing and allied health students (n=129)	Health issues for people with ID	Interactive workshops partly facilitated by people with ID, plus health Toolkit	x	x		Workshop was reported to be enjoyable and informative 80% of participants improved knowledge and awareness scores, Particularly positive feedback regarding spending time with people with ID.
Richard *et al.* 2005	Université d'Angers, France	Medical students	Disability and rehabilitation	Teaching on disability, rotation in rehab dept	x			**x** No improvement in attitude towards disabled people found pre- and post-teaching and clinical placement.
Sabharwal *et al.* 2000	Medical College of Wisconsin, USA	3rd year general internal medicine clerkship (n=129)	Movement & positioning skills for examining disabled patients	90 minute training workshop	x			OSCE with simulated patient showed intervention group performing significantly better than controls on all items, also positive student feedback on workshop.
Saketkoo *et al.* 2004	Tulane University School of Medicine, USA	4th year medical students (n=147)		3 hour workshop on disability skills and awareness, incl panel by PWD	x	x		Intervention group out performed controls on a standardized patient clinical case on communication and attitudes and knowledge, but not on examination. Project was well received by participating students.
Sanders *et al.* 2008	University of Kentucky, USA	Dental students (n=44)	Patients with developmental disabilities	Interactive multi-media virtual patient modules	x		x	Module simulated a patient encounter and was developed with participation from a deafblind patient. Significant gains in student knowledge and comfort.
Seccombe 2007	Universal College of	Nursing students (n=219)	Disability	Teaching followed by	x	x		**x** Shift to empowerment focused curriculum based on social model of disability, but no

Table 1 Continued

	Learning, NZ			clinical placement					significant improvement of attitudes.
Shapiro 2011	University of California Irving Medical Center, USA	Preclinical students	Social construction of disability	Film of mixed ability dance stimulates discussion	x	x			Raises awareness of disability issues, cultural representations, emotional responses, social attitudes.
Sharma *et al.* 2006	University of Miami, USA	Paediatric residents (n=63)	Childhood disability	Visits to families with disabled children		x	x		Residents gained fuller insights into life with disability, information needs, obstacles, adjustment. Good feedback.
Simpson *et al.* 2008	City University, London UK	Pre-registration mental health nursing students (n=35)	Experience of mental illness	Involvement with service users through online discussion forum		x	x		More active participation from service users than students. Students and service users overwhelmingly positive about experience.
Street *et al.* 2007	University of Bristol/ University of West of England, UK	Pre-qualification medical and paediatric nursing students (n=160)	Childhood disability	Paired students visited disabled child at home and reported back to peers			x		Inter-professional learning (IPL) aimed to gain holistic view of implications of childhood impairment, and understand how families/ children experience the services and professionals they engage with. Nursing students had more positive attitude to IPL, which built their confidence, and had significant attitude change to disability. All students appreciated experience.
Symons *et al.* 2009	University of Buffalo School of Medicine	Medical students	Health needs of pwd, comm'cation,		x	x	x	x	Attitude survey before and after curriculum: control group of med students from another university. No

Table 1 Continued

	and Medical Sciences, US		community resources					results published yet. OSCE as part of assessment process.
Tandon *et al.* 2011		3rd medical students (n=25)	Ageing and health	Lecture by specialists followed by interactive panel with 6 older citizens	x		x	Students reported attitudes to and understanding of older people improved.
Thistlethwaite & Ewart 2003	Leeds University, UK	Undergrad medical students	Valuing diversity	13 seminars led by disabled people, people with ID, among other minority communities.	x	x		Informal feedback very positive, particularly about breaking down stereotypes and thinking about how to communicate.
Thomson & Hilton 2012	St George's, King's College, London, UK	Pre-registration physiotherapy students	Physiotherapy	Evaluation of patient and carer involvement in physio education		x	x	In 1st year, patients acted as storytellers; carers shared experiences in 2nd year; patients assessed students work in 3rd year. Focus groups found students appreciated chance to intract with service users, valued practical application of theory, challenge to their assumptions about disability.
Tracy & Iacono 2008	Monash University, Australia	4th year medical students (n=128)	Intellectual Disability	3 hr communication skills session featuring tutors with ID	x	x		Interction with people with ID increased students comfort levels significantly. Very positive evaluation of session by students.
Westmoreland *et al.* 2009	Indiana University, USA	1st & 2nd year medical students	Geriatrics education	Reflective writing exercise plus 75 minute dialogue with			x	Before and after analysis of reflective writing revealed 27% changed attitudes to older people, significant improvement on Geriatrics Attitude Scale,

Table 1 Continued

				Council of Elders				98% positive student feedback.
Zwahlen *et al.* 2010	University of New Mexico, US	Undergrad medical students (n=347)	Geriatrics education	Lectures and PBL, plus interview/ assessment of older patients	x	x		Knowledge improved significantly, attitudes did not improve significantly.
			IN SERVICE TRAINING					
Dobson *et al.* 2002	Horton Park Health Centre, Bradford	Care staff (n=n=9)	Communicating with people with profound ID.	Interdisciplinary workshops using video	x			Improvements in verbal communications, gaze monitoring and positioning.
Freudenthal *et al.* 2010	University of Idaho, USA	Health professional volunteers (n=56)	Special Olympics Healthy Athlete events at World Winter GamesFig	Screening and health promotion sessions			**x**	Pre- and post-event questionnaires, including Prognostic Belief Scale. Positive effect of interaction but not statistically significant, perhaps because high pre-test scores in self selected sample of volunteers. Very positive qualitative results.
Jurczyk & Kelly 2009	Mountain Area Health Education Center, North Carolina USA	Community physicians (n=8)	Primary care for persons with developmental disabilities	Mini-fellowship	x	x	x	Goal of building community of peers to advance field of adult developmental medicine, develop curriculum and extend across the country.
Melville *et al.* 2006	University of Glasgow	Practice nurses (n=75)	Primary care needs of people with ID	Training pack and 3 hour training event	x			81.4% agreed better able to meet needs of clients with ID, 66% had made changes to clinical practice. Significant improvements in knowledge. Participation in training as

Table 1 Continued

							well as receipt of pack associated with greater changes in knowledge and self-efficacy.
Wong & Wong 2008	University of Hong Kong	Staff in residential settings for people with ID	Supporting self-determination in people with ID	6 sessions of staff training using interactional attitude-knowledge-skills model	x		Training focused on communication and facilitation skills, used analysis of videotaped role play, also homework assignments. Significantly positive changes in intervention group versus controls.

engage with students online and paid a small honorarium. All students and service users interviewed were overwhelmingly positive about the experience.

Placements or visits with community facilities and organizations (nine papers)

Service learning is an experiential learning approach where students learn by doing (Gitlow & Flecky 2005). Prior training can enhance the benefits of placement in community facilities, for example with older adults with dementia (Fruhauf *et al.* 2004), and thus improve learning of interaction skills. An Australian study where medical students spent eight weeks on placement in rural special schools led to better understanding of children with special needs (Jones & Donald 2007). In Leicester, medical students and social workers had four-week placements in community hospitals, together with training delivered by a Centre for Integrated Living (Anderson *et al.* 2010).

Simulation exercises (four papers)

A traditional way of changing attitudes is via simulation exercises – for example, spending time in a wheelchair or wearing spectacles that simulate sight loss (Crotty *et al.* 2000, Amosun *et al.* 2005) or wearing incontinence undergarments to engender empathy (Karlowicz & Palmer 2006). The goals are to develop interpersonal skills, increase empathy and educate about practical issues, such as accessibility (Crotty et al. 2000). While these experiences seem to be highly valued by participants, there is a risk of seeing disability in individualistic terms. If the main problems of disabled people result from poverty, prejudice and discrimination, then sitting in a wheelchair for half a day is unlikely to result in a full understanding, and may even distort perceptions.

Clinical experience (nine papers)

Symons *et al.* (2009) argue for the importance of introducing students to caring for patients with disabilities early in their career, and ensuring that disability is integrated throughout the curriculum and at every stage. They suggest that the skills acquired through caring for patients with disabilities are transferrable to other patient care and foster general professionalism. Markström *et al.* (2009) found that five-week clinical placements for students in healthcare professions reduced stigma associated with mental illness. Swiss dental students who were able to treat older people reported feeling less pity and frustration than German students, who could observe problems but not help (Nitschke *et al.* 2009).

Continuing education

In-service training has also been successfully trialled. For example, practice nurses in Scotland were trained in the primary healthcare needs of people with intellectual disabilities (Melville *et al.* 2006) with concrete outcomes. Interdisciplinary experiential training workshops delivered to care staff at a day centre for people with intellectual disabilities improved their communication and interaction with clients (Dobson *et al.* 2002).

Teaching modalities

Inter-professional education appears particularly appropriate for learning about disability, given that disabled people often engage with a multiplicity of different professionals (Anderson *et al.* 2010). Bringing together social work students with medical students, or nursing students with medical students, or a range of health professional students, has been effective (Street *et al.* 2007, Markström *et al.* 2009, Anderson *et al.* 2010, Anderson *et al.* 2011).

Innovative curricula drawing on the humanities have potential to illuminate and broaden the professional's understanding of disability (Evans 2002, Kaptein & Lyons 2009). For example, an intervention using narratives of hearing loss enabled audiology students to think beyond technical issues and improved their listening skills (Berg *et al.* 2008). Other interventions have drawn on reflective writing (Westmoreland *et al.* 2009), cinema (Block *et al.* 2005) and performance (Kahtan *et al.* 1994, McClimens & Scott 2007, Shapiro 2011).

Outcomes of interventions

Impact of these interventions was generally assessed by pre- and post-intervention attitudinal change, tests of knowledge, and/or by student feedback (consistently positive, e.g. Crotty *et al.* (2000) found 96% positive feedback). There is a need for an updated instrument for measuring healthcare professional attitude (Lam *et al.* 2010). Across the included studies, significant improvement in knowledge was common, although this sometimes tailed off over time. However, it was sometimes harder to detect improvements in attitudes when the sole intervention was traditional teaching (Richard *et al.* 2005, Seccombe 2007, Zwahlen *et al.* 2010).

Across the studies, the most positive evaluations were of opportunities to meet disabled or older people, associated with positive change in attitudes (Gitlow & Flecky 2005, Denton *et al.* 2009, Moroz *et al.* 2010, Anderson *et al.* 2011, Read & Rushton 2012), even when only conducted online (Simpson *et al.* 2008). Spending time in clinical settings (Markström *et al.* 2009) is also positively valued, but does not necessarily lead to attitudinal change (Richard *et al.* 2005, Seccombe 2007).

If students are to take disability seriously, it needs to be part of their assessment. Good practice is to use Standardized Patient Clinical Cases (Saketkoo *et al.* 2004) or Objective Standardized Clinical Encounters (Crotty *et al.* 2000, Sabharwal *et al.* 2000, Symons *et al.* 2009) to assess student learning, with disabled people being trained as standardized patients.

The best measure of effectiveness would be patient-reported satisfaction with health professionals who had undergone a particular form of training. Such longitudinal impact evaluations appear to be absent from the literature.

Discussion

There are many different ways of teaching students about disability, and the included papers often do not give a clear impression of the content and philosophy underlying the interventions. Medical educators themselves may need to examine their own attitudes and understandings (Gitlow & Flecky 2005), particularly tutors who are responsible for guiding clinical education.

Achieving a holistic understanding requires meeting healthy disabled and older people and learning from them. Half of the interventions did involve direct contact in a non-clinical setting. However, only 16% of the interventions studied in this paper entailed the disabled person acting as an expert, teaching the students. The greatest learning seems to come when students are encouraged to critically reflect on their experiences (Crotty *et al.* 2000, Duggan *et al.* 2009), including their emotional reactions to disability. One-off interventions or lectures are less effective than immersive workshops or combinations of activities. The 'spiral of learning' approach, where a range of strategies are used across different years of the medical school curriculum, reinforcing learning points, seems likely to deliver the best outcomes (Corwin *et al.* 2006, Symons *et al.* 2009), particularly given that disability is complex and multi-faceted.

Obstacles to improving teaching about disability include clinical overload (Dehaitem *et al.* 2008) and time pressures. Elaborate initiatives may be demanding in terms of preparation and/or delivery (Anderson *et al.* 2010, Corwin *et al.* 2006, which raises sustainability questions (Burbank *et al.* 2006). Innovation in disability teaching may rely on one member of the education team having the necessary knowledge and enthusiasm.

This review included nearly 50 papers describing more than 90 different teaching and learning activities. While we cannot say definitively what

works best to improve health professional knowledge and attitudes in the area of disability, it seems clear that learning from success and widespread adoption of good practice is required, if the ambitions of the Convention on the Rights of Persons with Disabilities are to be achieved.

Note

Tom Shakespeare was responsible for the study design, analysis and writing up of this paper. Ira Kleine conducted literature research and reviewed the paper. The review was conducted whilst Tom Shakespeare was a staff member at the World Health Organization and Ira Kleine was an intern at the World Health Organization. The authors alone are responsible for the views expressed in this paper, and they do not necessarily represent the decisions or policies of the World Health Organization. Thanks to John Spencer for comments on the paper.

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