



Review article

Medical students' attitudes towards people with intellectual disabilities: A literature review



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ABSTRACT

The present paper provides a review of research on medical students' attitudes to people with intellectual disabilities. The attitudes of medical students warrant empirical attention because their future work may determine people with intellectual disabilities' access to healthcare and exposure to health inequalities. An electronic search of Embase, Ovid MEDLINE(R), PsycINFO, Scopus, and Web of Science was completed to identify papers published up to August 2013. Twenty-four studies were identified, most of which evaluated the effects of pedagogical interventions on students' attitudes. Results suggested that medical students' attitudes to people with intellectual disabilities were responsive to interventions. However, the evidence is restricted due to research limitations, including poor measurement, self-selection bias, and the absence of control groups when evaluating interventions. Thus, there is a dearth of high-quality research on this topic, and past findings should be interpreted with caution. Future research directions are provided.

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People with intellectual disabilities (ID) experience more health inequalities than persons without disabilities (Cooper, Melville, & Morrison, 2004). For example, they have a shorter life expectancy than people without ID (Emerson & Baines, 2010). Negative attitudes among healthcare staff towards the provision of healthcare to this population are a likely contributing factor in the health inequalities that they experience (Ditchman et al., 2013; Emerson & Baines, 2010). An attitude is a “psychological tendency, expressed by evaluating a particular entity with some degree of favour or disfavour” (Eagly & Chaiken, 1993, p. 1). While doctors play a key role in their healthcare, and teaching on ID often is part of medical schools’ curricula (Sinai, Strydom, & Hassiotis, 2013), few studies have investigated medical students’ attitudes to people with ID.

This is an important omission because they are tomorrow’s doctors (General Medical Council, 2009) and every student will provide healthcare to this population at some stage (Lennox & Diggins, 1999a). Indeed, in response to Mencap’s (2007) *Death by Indifference* report that aimed to change health professionals’ attitudes towards people with ID, Michael’s (2008) *Healthcare for All* recommended that teaching on ID should invariably be provided for undergraduate medical students. According to Lennox and Diggins (1999b), both the quantity and quality of medical education on this subject need to be increased to improve practitioners’ healthcare provision and management for this clinical population. Different teaching strategies have been recommended, such as the inclusion of people with ID and their family and friends in teaching (Lennox & Diggins, 1999a, 1999b).

Emphasising the need for medical students to have positive attitudes towards people with ID and feel comfortable communicating with them, Piachaud (2002) recommended the inclusion of teaching on ID, which simultaneously addresses attitudes, skills, and knowledge, early in the first year of undergraduate programmes. After surveying experts on ID, Lennox and Diggins (1999b) identified six attitudes that medical students ideally should have when they finish their undergraduate education, if they are to successfully meet the health needs of this population. They stated that medical students should: (a) believe that people with ID should receive equal treatment by health providers; (b) look beyond the disability and see the person first; (c) respect and appreciate their equal rights; (d) be open to examining their own attitudes; (e) respect carers’ information and opinions; and (f) respect the wishes and beliefs of this patient group and their families.

Thus, medical students’ attitudes to people with ID are important (Michael, 2008) and medical schools have been urged to provide better ID teaching to foster the development of positive attitudes among their students (Lennox & Diggins, 1999b; Piachaud, 2002). Despite this, the health inequalities experienced by people with ID (Emerson & Baines, 2010), and reports documenting how doctors’ negative attitudes are implicated in the premature deaths of patients with ID (Mencap, 2007), medical students’ attitudes towards this patient group have received little empirical attention. This paper aims to provide an enhanced understanding of medical students’ attitudes to people with ID by reviewing extant research on this topic. A subsidiary goal is the elucidation of future research directions that would incrementally advance the literature base.

1. Method

1.1. Search strategy

The electronic databases Embase, Ovid MEDLINE(R), PsycINFO, Scopus, and Web of Science were used to search for manuscripts that examined medical students’ attitudes to people with ID. The search was conducted within the titles and abstracts of English language journal articles published before the end of August 2013. Search terms were: (attitud* or aware* or behave* or belief* or bias* or discriminat* or emotion* or experience* or feeling* or opinion* or perception* or perspective* or prejudice* or stereotyp* or stigma* or view*) and (down* syndrome or developmental* delay* or developal* disab* or intellect* challeng* or intellect* disab* or learning disab* or mental* deficien* or mental* handicap* or mental* retard*) and (medic* adj4 clerk* or medic* adj4 intern* or medic* adj4 school* or medic* adj4 student* or medic* adj4 undergrad* or medico or md student* or student doctor* or student physician*).

1.2. Review process

The authors discussed and established clear inclusion and exclusion criteria. They agreed to only include studies that investigated medical students’ attitudes towards people with ID and/or their healthcare. Given the limited amount of research on this topic, studies that used measures of attitudes to people with disabilities (i.e., studies that did not use ID-specific measures) to assess participants’ attitudes to people with ID were included, as were studies whose participants were a combination of medical students and professionals or other students. The authors agreed to exclude the following types of articles: examinations of medical students’ views on training in ID, which did not assess participants’ attitudes towards people with ID and/or their healthcare (e.g., Burge, Ouellette-Kuntz, Isaacs, & Lunsby, 2008; Burge, Ouellette-Kuntz, McCreary, Bradley, & Lechner, 2002); studies without a focus on ID (e.g., Beausoleil, Zalneraitis, Gregorio, & Healey, 1994; Wonkam, Njamnshi, & Angwafo, 2006); and research without medical students (e.g., Boyle et al., 2010; Parchomiuk, 2013). Then, the first author reviewed the literature. Nine hundred and thirty-six items were imported into Zotero and 377 duplicates were removed, leaving 559. After reading their titles and abstracts, 507 clearly irrelevant items were deleted. The remaining 52 articles were read in full, with 28 irrelevant articles removed after this examination. This process resulted in the retention of 24 studies that examined medical students’ attitudes towards people with ID.

While the Critical Appraisal Skills Programme (CASP; 2013) checklist for evaluating qualitative work guided the review of Karl, McGuigan, Withiam-Leitch, Akl, and Symons (2013), the Cochrane Public Health Group’s (n.d.) quality assessment tool

informed the review of the twenty-three quantitative papers. The latter focused attention on the following topics: selection bias, allocation bias, confounders, blinding, data collection methods, withdrawals and dropouts, analysis, and intervention integrity.

2. Results

2.1. Overview of studies

Twenty-four articles published between 1968 and 2013 met the inclusion criteria, all of which reported on separate studies. Studies mostly were conducted in the UK ($n=9$), followed by the USA ($n=8$), Australia ($n=3$), Ethiopia ($n=2$), Canada ($n=1$), and China ($n=1$). Eighteen studies sampled medical students only (e.g., Hall & Hollins, 1996; Khandelwal & Workneh, 1987) and 6 used samples that included medical students and other groups (e.g., healthcare professionals; Handler, Bhardwaj, & Jackson, 1994). All studies used surveys (with closed and/or open-ended questions) to assess students' attitudes; no focus groups or interviews were conducted. Twelve studies used a pre-test post-test design, 10 cross-sectionally analysed attitudes, 1 was experimental, and another was qualitative.

Using the aforementioned critical appraisal tools, each study's strengths and limitations were determined. Strengths included low attrition rates and attention to inter-group contact theory (Pettigrew, 1998) to explain medical students' attitudes. However, these strengths were offset by disadvantages. For example, most studies employed ad-hoc measures with questionable psychometric quality; no study blinded researchers to the intervention; and only Sinai et al. (2013) reported a power calculation. The studies are reviewed in the following sections and an overview is given in Table 1.

2.2. Studies on attitude interventions

Findings suggested that interventions disparately affected attitudes; however, there were methodological concerns.

2.2.1. Research suggesting minimal or no attitudinal change

Sinai et al. (2013) investigated attitudes towards the community inclusion of persons with ID among fourth-year medical students in the UK. The students reported favourable attitudes and these remained unchanged after a 14-week neurosciences block that included ID teaching. However, results should be interpreted with caution. It is unclear if participants attended the teaching block, and self-selection bias may have influenced results as only 136 and 133 students completed the questionnaire beforehand and afterwards, respectively, despite 387 students invited to participate. An amended, shortened version of the Community Living Attitudes Scale–Mental Retardation (CLAS-MR; Henry, Keys, Jopp, & Balcazar, 1996) was used, whose psychometric properties have not been assessed. Also, mean imputation for missing data was employed, a strategy that should be avoided (Allison, 2001).

Laking (1988) compared UK medical students who had, and had not, completed a course on ID psychiatry. A modified version of the Attitudes to Disabled Persons Scale (ATDP; Yaker, Block, & Campbell, 1960) was employed. Items were changed with “mentally handicapped” replacing “disabled,” which is poor psychometric practice because word substitution is unlikely to produce items that optimally measure the intended latent construct. Students were not randomly assigned to conditions (i.e., course completion or not) and there appears to have been a self-selection bias (i.e., most students who completed the course reported previous contact with this group, which may not be representative of medical students). Also, listwise deletion was used for cases that did not complete the ATDP, a suboptimal strategy for the management of missing data (Allison, 2001). The two groups reported comparable attitudes and Laking (1988) suggested that the ATDP might not be sensitive enough to detect changes in attitudes over time.

May (1991) also studied ID teaching's impact on UK medical students' attitudes. In general, most students supported the rights of this group; however, before teaching, only 42%, 33%, and 13% supported their rights to have children, leave home upon adulthood, and attend mainstream schools, respectively. Although students were more likely to support people with ID's right to attend mainstream schools after the intervention, results suggested that teaching typically did not improve attitudes. However, the “crude measuring instruments” (May, 1991, p. 241) might have been unable to capture attitudinal change.

2.2.2. Research suggesting worsened attitudes

Khandelwal and Workneh's (1987) study demonstrated that an intervention might deleteriously affect attitudes. They found that the attitudes of 100 Ethiopian medical students worsened after a six-week full-time course in psychiatry. The course covered various conditions including ID, with students completing a measure, designed by the authors, before and after. Participants' responses suggested that, upon completion of the course, more students believed that people with ID were unable to work or marry. For example, beforehand, 35% of students believed it was impossible for someone with ID to get married; however, afterwards, this figure increased to 65%. The intervention's non-specificity to ID, and the assessment tool's narrow focus, may be limitations.

2.2.3. Research suggesting improved attitudes: intellectual disabilities-specific measures

Several studies reported that interventions led to self-reported improvements in attitudes among medical students (e.g., Fishler, Koch, Sands, & Bills, 1968; Hall & Hollins, 1996; May et al., 1994; Simeonsson, Kenney, & Walker, 1976; Thacker,

Table 1
Overview of studies included in the review.

Authors	Design	Location	Sample	Study's focus	Attitudinal measurement	Information provided on psychometric properties	Key attitudes-related results
Andrew et al. (1998)	Pre-test post-test	USA	125 third-year medical students in a paediatric clerkship completed an educational experience, with 115 doing a questionnaire	Educational experience that focused on children with developmental disabilities, and parents' psychosocial issues	Survey assessed students' opinions on where people with disabilities should live, the education they should get, as well as students' knowledge of, and exposure to, people with disabilities. Open-ended and Likert-type response options	None	Most students reported enjoying and learning from the educational experience. 68% said their attitudes changed at least moderately
Boyd et al. (2008)	Pre-test post-test	USA	48 physician assistant students; 31 graduate nursing students; 18 undergraduate nursing students; and 4 medical residents	Training intervention's effects on students' knowledge and perception of difficulty in providing care to female health patients with developmental disabilities	The eight-item Disability Situations Inventory - Women's Health Version (developed by the authors) measured perceived difficulty in addressing the needs of individuals with developmental disabilities. Five-point Likert-type scale (1 = least difficult; 5 = most difficult)	The authors created items with input from others (e.g., faculty)	Participants reported less difficulty working with patients with developmental disabilities after the intervention than beforehand
Fishler et al. (1968)	Pre-test post-test	USA	36 fourth-year medical students	Intervention's effects on medical students' comprehension of ID	Students ranked in order of importance 10 problem areas related to ID; selected what advice about care (from 4 options) they would give to parents of a new-born child with ID	None	Students ranked medical and psychological as more important problem areas, and custodial and sterilisation less important problem areas after clinic experience; however, their advice remained the same afterwards
Hall and Hollins (1996)	Pre-test post-test	UK	28 medical students	Medical students' attitudes towards people with Down's syndrome before and after a workshop given by people with ID	Students rated how much they agreed with ten statements about people with Down's syndrome (response options ranged from "strongly agree" to "strongly disagree")	None	After the workshop, self-reported attitudes improved, with changes on seven statements reaching statistical significance

Table 1 (Continued)

Authors	Design	Location	Sample	Study's focus	Attitudinal measurement	Information provided on psychometric properties	Key attitudes-related results
Handler et al. (1994)	Cross-sectional	USA	136 medical students and 149 healthcare professionals	Medical students' and healthcare professionals' expectations about people with ID	Adapted version of the Prognostic Beliefs Scale (Wolraich & Siperstein, 1983) assessed expectations and prognostications for 3 target cases: a child with mild, moderate, and severe ID. Expectations had 23 questions about functional capabilities. Prognostics had 4 levels of residential placement and 5 levels of vocational placement	A panel of experts assessed content validity	Medical students' expectations were lower than healthcare professionals' expectations. Fourth-year students had higher expectations than those in earlier years. No relationship was found among medical students' expectations and background variables, such as having a family member with a disability
Holt and Bouras (1988)	Cross-sectional	UK	166 medical students	Medical students' attitudes to ID	Questionnaire with questions about terminology, feelings, causes of ID, and contact with people with ID	None	Students reported favourable attitudes. While they wanted to learn more about this group, only 10% wanted to work in ID services
Karl et al. (2013)	Qualitative	USA	144 third-year medical students	Effects of a clinical experience that involved caring for people with ID	Seven open-ended questions about the experience	Questions were developed through collaborative discussions among medical educators, patients, and health-care providers with experience in caring for people with disabilities	Students positively evaluated the learning experience. Four themes emerged: communication strategies; attitudes and comfort about disability care; the medical facility's organisational structure; and environmental and technological accommodations at the facility
Khandelwal and Workneh (1986)	Cross-sectional	Ethiopia	60 undergraduate medical students	Medical students' perceptions of, and attitudes to, mental illnesses, before the start of a 6-week psychiatric attachment	Questions about conditions (e.g., ID) depicted in vignettes representing conditions. Using a 3-point response scale (from normal to most serious), attitudinal ratings were made for gravity of the illnesses, their prognoses, and their influences on marriage prospects, family life, and work	None	92% regarded ID as an illness; 62% regarded it as very serious; 59% stated that its prognosis would remain the same; 35% stated that it would be impossible for a person with ID to get married; 78% stated that they would have some problem in their family life; and 25% stated that it would be impossible for them to work

Khandelwal and Workneh (1987)	Pre-test post-test	Ethiopia	100 medical students	Attitudinal changes among medical students after a psychiatric course	Same questions as Khandelwal and Workneh (1986)	None	After training, students were: more pessimistic about the prognosis of those with ID after training; more likely to think it is impossible for this group to get married; more likely to report believing they would have problems working; and as likely to believe they would have problematic family relations
Laking (1988)	Cross-sectional	UK	58 medical students, of whom 33 had completed a short psychiatry of mental handicap course	Medical students' attitudes, comparing those who did a short ID psychiatry course with those who did not	Modified version of the ATDP, with "mentally handicapped" substituted for "disabled" in the items. Response options were Likert-style, ranging from "Strongly agree" to "Strongly disagree"	No information provided about modified ATDP. Laking (1988) concluded that the ATDP was not a valid instrument to measure changes in attitudes over time	Those who did, and did not, do the course reported comparable attitudes to people with ID
Lennox and Chaplin (1995)	Cross-sectional	Australia	116 people took part, of which 78% were psychiatric trainees, 16% were medical officers, and 7% were psychiatrists	Perceptions of psychiatric care of people with ID	18 items assessed participants' opinions on management of people with ID and mental disorders. Response options for the 18 items were on a 6-point Likert-type scale, ranging from "very much agree" to "very much disagree"	Items were pretested on eight psychiatrists and psychiatric trainees, and revised based on their comments	Most participants believed: more training in this area is required; the standard of psychiatric care is poor; the standard of community and inpatient care is poor; and psychiatric care should be provided in specialised units. They reported positive attitudes towards people with ID, and suggested how to improve care
Li et al. (2012)	Cross-sectional	China	136 medicine students and 144 education students	Attitudes towards inclusion of people with ID	The 29-item Mental Retardation Attitude Inventory-Revised (Antonak & Harth, 1994) measured attitudes towards the inclusion of people with ID. Response options were on a 4-point Likert-type scale, ranging from "strongly disagree" to "strongly agree"	An alpha coefficient of .78 was reported (Hampton & Xiao, 2008). As the questionnaire's multidimensionality was not confirmed among a Chinese sample (Hampton & Xiao, 2008), it was used as a unidimensional questionnaire	Students of both disciplines reported comparably favourable attitudes. Females reported more positive attitudes than males. There was a positive association between attitudes and familiarity with this group

Table 1 (Continued)

Authors	Design	Location	Sample	Study's focus	Attitudinal measurement	Information provided on psychometric properties	Key attitudes-related results
May (1991)	Pre-test post-test	UK	26 medical students	Effects of ID teaching on medical students' attitudes towards people with ID	Questionnaires on students' responses to teaching and attitudes towards ID	None	When describing people with ID, positive (53%) and negative (47%) words were used. Some participants supported the group's civil rights, while others did not. After teaching: more participants supported this group right to attend "normal" school; fewer students were willing to work in ID; and general practitioners were viewed as less important to people with ID
May et al. (1994)	Pre-test post-test	UK	21 medical students answered questions before the programme and 16 medical students answered them afterwards	Effects of a teaching programme for medical students	Students were asked to: choose 10 words from a list of 43 words (containing 23 positive and 20 negative descriptors) that they thought described people with ID; and comment on the rights of this population	None	After the seminar, participants chose more positive and less negative words to describe people with ID. However, support for this group's rights did not change
Ouellette-Kuntz et al. (2012)	Cross-sectional	Canada	258 medical students	Attitudes of upper-year undergraduate medical students towards community inclusion of persons with ID	The Community Living Attitudes Scale—Short Form (CLAS; Henry et al., 1998), which is a 17-item scale with 4 subscales measuring: empowerment; exclusion; sheltering; and similarity. A 6-point Likert-type response format was used (6 = strong agreement; 1 = strong disagreement)	Adequate internal consistency, test-retest reliability, and construct validity were reported (Henry et al., 1996). However, inadequate internal consistency was reported in this study	Participants that were more familiar with patients with ID scored higher on sheltering. Participants that positively evaluated supervision scored higher on empowerment, and lower on sheltering, than those that negatively evaluated supervision
Scott and Rutledge (1997)	Cross-sectional	USA	80 first-year medical students	Attitudes towards people with ID	Attitude Towards Disabled Persons Scale. No citation was provided	The authors stated the scale was reliable and valid; however, no information was provided	Scores suggested attitudes were not negative. 77% were willing to work with this group post-training. 95% believed people with ID should live in the community

Simeonsson et al. (1976)	Pre-test post-test	USA	12 fourth-year medical students	Evaluation of training	43-item measure of attitudes to people with developmental disabilities. Six-point response options ranged from "disagree strongly" to "agree strongly"	None	After training, attitudes reportedly improved
Sinai et al. (2013)	Pre-test post-test	UK	136 medical students completed a questionnaire before teaching, and 133 medical students completed the questionnaire after teaching	Effects of teaching on medical students' attitudes towards people with ID and their knowledge about this group	Amended 17-item short form of the Community Living Attitudes Scale–Mental Retardation (Henry et al., 1996). There were four subscales: empowerment; exclusion; sheltering; and similarity. Questions were rated 1 (strongly disagree) to 6 (strongly agree)	The subscales have been shown to have acceptable test-retest reliability and internal consistency (Henry et al., 1996). The short form has correlated with the long form of this scale (Henry et al., 1999)	Attitudes did not change after teaching. Overall, participants' attitudes were favourable
St. Claire (1993)	Experiment	UK	7 doctors and 38 medical students	The role of social identification in medical students' and doctors' beliefs and behaviours vis-à-vis people with ID	46-item measure of beliefs about people with ID. A semantic differential format was employed, with each separately analysed. Each scale had two poles, separated by seven boxes. The questionnaire either was labelled: "Medical diagnosis and subnormality: beliefs about retardates" (clinical condition) or "Personality and perception: personal beliefs about retarded people" (personal condition)	None	People in the medical condition reported more negative beliefs about people with ID than those in the personal condition; however, the groups did not differ on differentiating between children with and without ID
Thacker et al. (2007)	Cross-sectional	UK	26 medical students attended the drama workshop; 14 medical students did not	Workshop's effect on medical students' perceptions of the abilities and qualities of people with ID	A questionnaire entitled attitude formation (Hall & Hollins, 1996)	None	Participants in the workshop reported more positive attitudes than those who did not take part in the workshop
Tracy and Graves (1996)	Pre-test post-test	Australia	25 first-year medical students who chose to do an ID teaching unit	Effect of teaching on medical students' attitudes to people with developmental disabilities	Before and after the unit, a questionnaire asked about whether students' feelings and beliefs changed over the unit and, if so, why; and what words they used to describe their feelings about people with developmental disabilities and their family members	None	After the unit, students reported more positive feelings and views towards this group

Table 1 (Continued)

Authors	Design	Location	Sample	Study's focus	Attitudinal measurement	Information provided on psychometric properties	Key attitudes-related results
Tracy and Iacono (2008)	Pre-test post-test	Australia	128 fourth-year undergraduate medical students	Effect of training on medical students' attitudes towards interacting with developmental disabilities	The Interaction with Disabled Persons Scale (Gething, 1994), which contains 20 statements describing attitudes towards interacting with a person with a disability. Higher scores reflect greater discomfort in social interaction. Items were rated on a 6-point Likert-type scale (1 = "I disagree very much" and 6 = "I agree very much")	The scale was developed in Australia and Gething (1994) reported adequate internal consistency for six subscales, and stated that items loaded onto six factors.	Students reported that they felt more comfortable interacting with people with disabilities after the session
Widrick et al. (1991)	Pre-test post-test	USA	39 third-year medical students	Effects of course on medical students' expectations about people with ID's functional ability	Prognostication about Mental Retardation Scale (Wolraich & Siperstein, 1983), which assesses prognostication skills and knowledge about the functional abilities of people with ID. It has 25 statements about functional tasks, which are divided into separate categories for people with mild, moderate, and severe ID. Students kept logs to enable researchers to investigate attitudinal change over time	Wolraich and Siperstein (1983) said the scale had evidence of discriminant validity, as it was able to detect differences in expectations among professionals. It was developed for professionals working in this area	Students were more optimistic after the course. Students were most optimistic about persons with mild ID, followed by those with moderate ID and, lastly, people with severe ID. The logs revealed that attitudes improved after home visits
Wishart and Johnston (1990)	Cross-sectional	UK	People with different degrees of experience, including ten medical students	Relationship between having experience of children with Down's syndrome and stereotypical responses about this group	Participants were asked to indicate to extent to which 26 personality characteristics described the personality of children with Down's syndrome. A 5-point rating scale was used, with opposing characterological terms at either end	Stereotypical words chosen were based on literature	Adults with frequent contact with children with Down's syndrome were less likely to rate their personality in a stereotypical manner. Medical students reported less stereotypical beliefs than others groups

Crabb, Perez, Raji, & Hollins, 2007). Using a sample of 12 American medical students (two did not complete post-test measures), Simeonsson et al. (1976) found that participants reported more positive attitudes towards people with ID after training on the topic. The authors also found more positive self-reported attitudes among participants that had better experiences of persons with ID. However, descriptive statistics only were given and psychometric support for their measure was not provided.

Fishler et al. (1968) also researched American students ($N = 36$), finding that they were less likely to rate sterilisation and custodial as important areas in ID, and more likely to rate medical and psychological as important areas, after clinical experiences in the area. Despite these experiences, and contrary to Fishler et al.'s expectation, students' advice regarding institutional versus home care for children with ID did not change. However, analyses may have lacked power due to the small sample.

The effects of ID training on American medical students' ($N = 39$) beliefs about people with ID's functionality also have been examined (Widrick et al., 1991). Scores on the Prognostication about Mental Retardation Scale (Wolraich & Siperstein, 1983) suggested that students were more optimistic about what people with ID can achieve after the intervention, with people with mild ID ascribed the greatest functional ability, followed by persons with moderate and severe ID, respectively. Students' comments, which also were recorded, suggested that they believed the intervention and, in particular, meeting with this population, increased their expectations about people with ID.

Boyd et al. (2008) examined the efficacy of an intervention that aimed to reduce 101 American students' difficulty with working with people with developmental disabilities. Results suggested that the intervention, which involved training with a virtual patient, achieved a reduction in students' perceived difficulty with providing care to this population. However, only four participants were medical residents, therefore limiting the relevance of this study to understanding medical students' attitudes to people with ID.

Hall and Hollins (1996) found that, among 28 medical students in the UK, attitudes towards people with Down's syndrome improved on 7 of 10 items after taking part in a workshop with actors with ID. For example, students were less likely to report that people with ID have little sense of humour and act like children most of the time. Thacker et al. (2007) used the same measure to examine a teaching intervention's effects on the attitudes of medical students in the UK towards people with ID. Again, the intervention involved actors with ID. Thacker et al. (2007) stated that, compared to 14 students who did not take part in the role-plays, the 26 students who did reported relatively positive attitudes. It was unclear whether the students were randomly allocated to attending or not, or if attendance was volitional. Further, neither Hall and Hollins (1996) nor Thacker et al. (2007) provided psychometric information about their measurement tool; thus, its reliability and validity are unknown, making the interpretation of results difficult.

2.2.4. *Research suggesting improved attitudes: generic measures*

Studies that used measures of attitudes towards persons with disabilities in general also suggested that ID teaching/training enhanced medical students' attitudes (e.g., Tracy & Graves, 1996; Tracy & Iacono, 2008). However, such measurement is problematic as scales non-specific to ID may omit critical aspects of students' attitudes towards this clinical group. Tracy and Graves (1996) examined whether an optional teaching unit on developmental disabilities influenced the attitudes of 25 Australian first-year medical students. At the beginning and end of the unit, students reported their thoughts and feelings towards people with disabilities and the patients' families. Before teaching, 56% of participants expressed discomfort and lack of confidence working with people with disabilities, and 92% wanted to become more knowledgeable about the area. Afterwards, 92% reported that their attitudes had changed over the course of teaching, with qualitative comments typically suggesting attitudinal improvement and identifying inter-group contact as an important change mechanism. However, due to the measure's non-specificity to ID, it is possible that the students' attitudes towards interacting with people with ID remained unchanged or worsened, whilst their comfort interacting with people with other disabilities increased. As measures' psychological constructs should be specific to the research goals (DeVellis, 2003), the validity of such findings is questionable.

Tracy and Iacono (2008) evaluated changes in 128 Australian fourth-year medical students' attitudes towards interacting with people with disabilities after training on developmental disabilities and communication skills. The students completed the 20-item Interaction with Disabled Persons Scale (Gething, 1994), which measured discomfort interacting with persons with a disability, before and after the intervention. Results suggested that the students were more comfortable interacting with people with disabilities after the intervention, with 77% of students valuing the opportunity to meet people with disabilities during the intervention. However, as with Tracy and Graves (1996), these findings are difficult to interpret due to the measure's lack of specificity.

Andrew, Siegel, Politch, and Coulter (1998) also used a generic measure of attitudes to those with disabilities in their evaluation of training, which included experiences with children with developmental disabilities. Little information was given about the chosen measurement tool and its psychometric properties are unknown; however, descriptive results suggested that students enjoyed and learned from the experience. Most students reported that their attitudes at least moderately changed, with 30% indicating unchanged attitudes. Attitude change was mostly attributed to a new awareness of family dynamics, and the most commonly reported behavioural intention arising from the intervention was a need for greater sensitivity when interacting with children with disabilities.

2.2.5. *Research suggesting improved attitudes: qualitative work*

Karl et al. (2013) qualitatively examined medical students' written responses to an Internet survey on their reflections about a clinical experience, in which they met patients with developmental disabilities and worked with professionals in this

area. A survey was used to avoid interviewer and response bias; however, the author did not describe consideration of the relationship between the researcher and participants as recommended by [CASP \(2013\)](#), and interviews or focus groups may have produced richer data. Results suggested that, after the intervention, students better understood the need to overcome communication barriers; were more comfortable caring for this population; and were more aware of diagnostic overshadowing and this group's right to equal healthcare standards.

2.3. Cross-sectional attitudinal studies that did not evaluate interventions

While cross-sectional research has provided snapshots of medical students' attitudes towards this population, studies frequently lacked methodological rigour. [Lennox and Chaplin \(1995\)](#) used four attitudinal items to examine the attitudes of 128 psychiatric trainees and 27 medical officers in Australia. Despite 30% of participants reporting that they would personally prefer not to treat people with ID and a psychiatric disorder, the majority of participants endorsed the need to investigate psychiatric symptoms among persons with severe ID, and recognised the utility of psychotherapy for persons with ID and a psychiatric disorder. No information on item generation was provided, and a rationale for the inclusion of only four items was omitted.

[Li, Tsoi, and Wang \(2012\)](#) found that 280 Chinese students of education or medicine reported comparably favourable attitudes towards the inclusion of persons with ID. Participants with more experience with this population, and females, reported more positive attitudes. However, the use of the Mental Retardation Attitude Inventory-Revised ([Antonak & Harth, 1994](#)) among Chinese people may be questioned because its factor structure was not replicated among a sample of Chinese people ([Hampton & Xiao, 2008](#)).

[Ouellette-Kuntz et al. \(2012\)](#) found that 258 Canadian medical students with experience of people with ID were more likely than those without such experience to score higher on sheltering (e.g., the belief that this population should be protected). Further analysis revealed that 88.5% of those with experience typically reported meeting with five or fewer persons with ID. Thus, their experience and consequent understanding may have been limited ([Ouellette-Kuntz et al., 2012](#)). Supervision's salience to attitudes emerged, with those who reported positive supervision experiences scoring higher on the empowerment of people with ID, and lower on the need to protect them in the community ([Ouellette-Kuntz et al., 2012](#)), than students who reported negative experiences of supervision. Whilst interesting, this study may have been limited by the authors' decision to use the CLAS-MR ([Henry et al., 1996](#)), as it only measures attitudes towards community inclusion and neglects a focus on medical students' attitudes to providing healthcare to people with ID.

[Holt and Bouras \(1988\)](#) used a short questionnaire based on [McConkey and McCormack \(1983\)](#) to examine 166 British medical students' attitudes towards people with ID. Findings predominantly indicated that students held favourable attitudes towards this clinical group, with 10% saying that they wanted to work in services for people with ID and participants typically disagreeing that people with ID would always act like children. Although encouraging, results may be explained by students' socially desirable responses and the measurement tool's psychometric qualities are unknown.

[Wishart and Johnston \(1990\)](#) examined stereotypical beliefs about children with Down's syndrome among different groups of British people, including 10 medical students. The role of previous contact with this group also was studied. In general, participants with more experience were less likely to endorse stereotypes, and medical students reported less stereotypical beliefs than other groups, including mothers with children with Down's syndrome. However, the measurement tool's content validity is questionable, and no psychometric information was provided, reducing the interpretability of the findings.

Prognostic beliefs among 136 medical students and 149 healthcare professionals in the USA also have received empirical attention ([Handler et al., 1994](#)), with students reporting lower expectations about people with ID than their qualified peers. Perhaps, counterintuitively, students' beliefs were unrelated to having a family member with a disability or working with people with disabilities. Compared to medical students in earlier years, fourth-year medical students reported more optimistic beliefs about this group's potential. Students were most pessimistic about people with severe ID, followed by those with moderate ID, and lastly persons with mild ID.

[Khandelwal and Workneh \(1986\)](#) used vignettes to assess 60 Ethiopian medical students' attitudes to various conditions, including ID. Ninety-two per cent of students said the person with ID was ill; 62% regarded it as a very serious illness; and 20% said the prognosis would worsen. Only 7% reported that the person with ID had the same ability to marry as anybody else, while 82% and 92% said the person would have at least some difficulty living at home and working, respectively.

[Scott and Rutledge \(1997\)](#) used an uncited ATDP to investigate the attitudes of 80 American first-year medical students to people with ID. The authors claimed the scale's reliability and validity when measuring attitudes towards those with disabilities; however, its specificity to ID and psychometric properties were not detailed. Scott and Rutledge suggested that scores on the ATDP indicated that most participants did not have negative attitudes towards people with ID. Most participants reported that they were willing to work with this population and believed that people with ID should live in the community.

2.4. Experiment on attitudes

[St. Claire \(1993\)](#) examined the role of social identification among 7 doctors and 38 medical students in the UK. The author hypothesised that, compared to participants whose personal identities purportedly were activated; those with activated

clinical identities would report more negative beliefs about people with ID and be more likely to attribute ID to children. Participants were randomly assigned to either condition and therefore received questionnaires titled, “Medical diagnosis and visual cues” or “Personality and person perception.” Participants in the clinical identity condition reported more negative beliefs than those in the personal identity condition, but people in both conditions were equally accurate distinguishing between children with and without ID. However, as a manipulation check suggested different social identities might not have been activated, this study’s findings should be interpreted with caution.

3. Discussion

This literature review identified 24 articles regarding medical students’ attitudes towards people with ID. The majority of the evidence reviewed consisted of evaluations of teaching/training interventions that sometimes resulted in improved self-reported attitudes. As these interventions often involved students interacting with people with ID (e.g., Hall & Hollins, 1996), findings are consistent with intergroup contact theory, which posits that contact between groups usually reduces prejudice (Pettigrew, 1998). Thus, opportunities for medical students to gain experience with this clinical group may be a key component of future attitudinal interventions. However, as recommended by Corrigan and Penn (1999), interventions to reduce stigma “should not be accepted on faith” (p. 765); instead, their theoretical underpinnings and empirical support warrant scrutiny. This point seems particularly salient, as ID stigma research has not used systematic approaches with conceptual models (Ditchman et al., 2013).

To address this omission, future research may experimentally examine interventions characterised by intergroup contact under optimal conditions of equal status between groups, shared goals, cooperation between groups, and organisational support (Allport, 1954); high levels of intimacy between groups; and minimal differences between the persons with ID involved and their stereotype (Corrigan & Penn, 1999). As the number, frequency, and quality of contacts may be important (Morin, Rivard, Crocker, Boursier, & Caron, 2013), the roles of these variables should be assessed. Also, as students’ attitudes towards persons with ID may be associated with their supervision (Ouellette-Kuntz et al., 2012), future research may examine if quality of placement supervision moderates the effectiveness of interventions on students’ attitudes and future clinical behaviours.

In line with other areas of ID research (Ditchman et al., 2013; Rose, Rose, & Kent, 2012; Werner, Corrigan, Ditchman, & Sokol, 2012), there is a need for scale development. Specifically, a measure of medical students’ attitudes to people with ID is needed if the efficacy of interventions is to be determined in a valid manner. As precise definitions of psychological constructs facilitate valid measurement (Eagly & Chaiken, 2007), the conceptualisation of medical students’ attitudes to persons with ID requires empirical attention. According to Eagly and Chaiken (2007), attitudes may be: (a) covert or overt; (b) cognitive (e.g., thoughts and beliefs), behavioural (e.g., intentions and overt actions), or affective (e.g., feelings and emotions); and (c) conscious or unconscious.

Eagly and Chaiken (2007) described explicit and implicit attitudes, noting that the former represent evaluations reported by the person holding the attitude, and the latter represent spontaneous emotional reactions that the person may not be consciously aware of. As explicit and implicit attitudes may predict volitional and spontaneous behaviour, respectively, both warrant empirical attention (Eagly & Chaiken, 2007). Further, people may hold an explicit attitude and an implicit attitude towards the same entity, and each may be differentially affected by an intervention (Wilson, Lindsey, & Schooler, 2000). Thus, future research may wish to examine the effects of pedagogical interventions on explicit and implicit attitudes of medical students.

4. Conclusion

This review suggests that teaching and training may improve medical students’ attitudes, with interventions driven by intergroup contact theory (Pettigrew, 1998) holding promise. However, the review also identifies the need for more robust research to accurately understand (a) medical students’ attitudes towards people with ID and (b) the kinds of interventions that improve these attitudes. Attitude enhancement is the ultimate goal of research on ID stigma (Ditchman et al., 2013). Indeed, if tomorrow’s doctors’ attitudes towards this population do not improve, efforts to reduce health inequalities experienced by people with ID (Emerson & Baines, 2010; Turner & Robinson, 2010) may well have limited success.

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