REVIEW ARTICLE

Health student regard for substance-using patients as measured by the Medical Condition Regard Scale: a systematic review

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Objectives: As clinical impartiality is an accepted basic principle of ethical practice, any proactive exercises that may inform selection, training, clinical placements, and other interventions, which promote future positive and equitable professional conduct, thus guarding against future discriminatory attitudes are germane. Within this context, the purpose of this review was to identify trends and patterns in health student, namely future practitioners', regard for substance-using patients using the Medical Condition Regard Scale.

Methods: Six electronic databases were systematically searched for studies that used the Medical Condition Regard Scale as an outcome measure in assessing health student regard for drug-using patients. Academics who had published in this area were also consulted to recommend texts that would complement the above citation sourcing process. Following an elimination of duplicates, the application of inclusion and exclusion criteria, as well as conducting citation searches, 16 studies were incorporated in the final review. Although the quality of all included studies was satisfactory, no study was free from a potential source of bias.

Results: This review found that patients with drug-use problems were consistently held in the lowest echelons of regard by trainee health practitioners. The impact of sex, age, year of course, and personal exposure to mental health difficulties in predicting negative regard was unclear.

Conclusions: Unless addressed, patients with drug problems may have a high potential for future treatment marginalisation by tomorrow's health professionals. This scenario needs to be proactively managed by all stakeholders through a greater investment in educational and clinical training placement opportunities.

Health student regard for substance-using patients: a systematic review

Clinical impartiality, that is not allowing considerations of disease, disability, or social standing to interfere with one's duty to their patient, underpins globally accepted standards of ethical and professional good practice (Office of the United Nations High Commissioner for Human Rights, 2008; WMA - The World Medical Association-WMA Declaration of Geneva", 2016). Certain conditions are associated with practitioner stigma, low regard, and negative attitude (Link *et al.* 1997). This is a health care concern (Dearing & Steadman, 2008) as practitioner attitudes and behaviours are related to a range of clinical outcomes (Hojat, 2006; Hemmerdinger *et al.* 2007; Norcross & Wampold, 2011; Kelm *et al.* 2014). Substance use disorders (SUD) are

associated with stigma, barriers to health care, mortality, multiple comorbidities, suicide, trauma, and poor clinical outcomes (McGinnis & Foege, 1993; Volkow, 2010; Ford, 2011; Collins & Lapsley, 2013; Death, 2016; Addiction and Health, 2014). Notwithstanding the availability of potential interventions (Kothari *et al.* 2011), negative practitioner attitudes to patients with SUD contribute to suboptimal health care provision (van Boekel *et al.* 2013). This may be a function of restricted clinician responsiveness, notions of blame, poor communication and engagement, not identifying patient needs, misattributing symptoms, and offering inadequate treatments (Miller & Brown, 2009; Gilchrist *et al.* 2011; van Boekel *et al.* 2013; Broadus & Evans, 2015; Petry, 2015).

A recent systematic review (van Boekel *et al.* 2013) examining stigma among qualified health practitioners found that attitudes towards substance-using patients were generally adverse. Practitioners' regard towards working with substance users, particularly illicit drug

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users, was consistently lower than that for other patient groups. Some reviewed studies found; however, that attitudes were influenced by practitioners' discipline, function, work experience, level of contact, and personal factors (Ding *et al.* 2005; Brener *et al.* 2007; Gilchrist *et al.* 2011).

Health students are an important research population whose regard for drug-using patients may represent prevailing socio-cultural notions and the influence of formal training contributions. Negative student attitudes may impact upon future professional behaviours (Ahmedani *et al.* 2011; Williams *et al.* 2015*a*). Research in this area may provide students, academics, and treatment commissioners with important information regarding emerging professionals' regard for their future SUD patients, possibly one of the most prevalent and harmful conditions they may encounter. The systematic integration of such data may prove invaluable in informing academic and training bodies about the need for curriculum development, selection, training, or other interventions, which will underscore the standard that all patients are equally deserving of supportive quality care, regardless of health condition.

The focus of this review was on Medical Condition Regard Scale (MCRS) outcome measures as this psychometric tool was first developed with a health student population (Christison *et al.* 2002) and has been used in many studies to evaluate health student and practitioner attitudes to SUD patients (Nutt *et al.* 2017). It has recognised validity and reliability with a Cronbach's coefficient α of 0.87 and a test–re-test reliability of 0.84 (Christison *et al.* 2002). Although a number of scales assess facets of stigma, or attitudes towards particular conditions, or are designed for unique patient or professional populations (Yang & Link, 2015), there is a paucity of established, valid, reliable, and non-condition-specific measures of stigma. The MCRS has; however, the capacity to provide a generic and practical measure of negative or positive biases, emotions, and expectation among any care-giver population, which can be applied to all medical conditions, and allow for comparisons or variations between them (Christison *et al.* 2002). The MCRS measures anticipatory feelings, including an 'enthusiasm' or 'willingness to treat specific diagnostic groups', as well as whether such medical conditions are considered treatable and worthy of medical resources. This attitudinal or preferential facet of stigma (Christison *et al.* 2002; Rose *et al.* 2007; Kubiak *et al.* 2011) is a psychological construct of practical and applied relevance to clinicians and trainers alike. The MCRS has been used to investigate patient regard among health trainees from various disciplines, towards many different types of medical diagnoses, including drug use, in a range of settings (Christison & Haviland, 2003; Brown *et al.* 2010;

Ahmedani *et al.* 2011; Kubiak *et al.* 2011; McKenna *et al.* 2012). Notwithstanding the above, a search of The Campbell Collaboration (Campbell Library, 2015), University of York's Centre for Reviews and Dissemination (CRD) (PROSPERO, n.d.), and the Joanna Briggs Institute's Systematic Review Database (JBI Database of Systematic Reviews and Implementation Reports, 2016) confirmed that no systematic reviews of student attitudes to SUD patients using the MCRS have been registered.

As no systematic reviews examining MCRS outcome data for health student attitudes towards patients with drug problems has been conducted, this body of research has never been evaluated, consolidated, and synthesised in a structured manner. The consistency and generalisability of health student MCRS findings, the existence of trends across different health student populations and settings, and whether such information can reliably contribute to valid decision-making (Mulrow, 1994), is thus yet to be determined. This represents a marked knowledge gap, particularly as health students are a population ideally positioned to benefit from proactive or remedial interventions that could address attitudes suggestive of future unsupportive or discriminatory practice. Amalgamating findings regarding health student willingness to treat SUDs, and whether they view such medical conditions as treatable and worthy of resources may delineate the need for further research, the refinement of selection and training techniques, development of professional protocols, and any other supports shown to moderate attitudes likely to impact negatively upon health care activities.

Aim and objectives

The principle aim of this review was to determine how health students regard substance-using patients, by systematically reviewing all relevant health student research employing MCRS outcomes, a measure having practical and functional utility to clinicians and trainers alike.

Method

Search strategy

Following an iterative scoping exercise, six electronic databases (as listed below) were systematically searched for all citations relevant to this study. The date of the MCRS's first publication (Christison *et al.* 2002) determined the start of search time frame, with the search focus being from this period up to the first quarter of 2016. Although eligible studies were principally sourced via electronic searches using analogous search strings for each database, published authors in this field were also emailed in an effort to discern further citations

qualifying for review. This was a secondary strategy to capture non-electronically available citations, as well as to detect 'grey literature' not located within traditional academic distribution channels. A 'backward and forward' citation search was conducted in an attempt to designate potential references not uncovered electronically or by expert recommendation.

Database search terms

Following the employment of the Population, Intervention/Indicator, Comparison, Outcome of interest (PICO) model (Liberati *et al*. 2009) to assist in search term formulation, a broad search term strategy was employed to diminish selection bias and to ensure the most inclusive citation yield possible. As per expert recommendation (Systematic reviews and meta-analyses: a step-by-step guide, www.ccace.ed.ac.uk, 2016), the formulated search term string [i.e. students AND (addiction OR alcohol OR drug OR substance) AND 'Medical Condition Regard Scale'] was subject to the unique search protocol rules and requirements of the different databases employed. These individual search strings were comparable and analogous. The electronic databases EMBASE, PsycINFO, PubMed, PubMed Central, Scopus, and Web of Knowledge were searched (see Appendix for full information on the search terms used for each database search). Potentially relevant studies published in peer-reviewed journals since the initial publication of the MCRS were identified. The last search was conducted in March 2016.

Inclusion and exclusion criteria

K.D. and M.P. established inclusion and exclusion criteria in advance. Only studies surveying the attitudes of students towards patients with medical conditions, of which one was a drug or substance-using disorder, using the MCRS as an outcome measure were included. All studies referring generically to an addiction, or to drug or substance use, or approached by the primary researchers as such, were eligible. Observational studies such as disseminated by journal article, conference proceedings, book chapter, 'grey literature', or academic thesis were eligible for inclusion. Given the well-documented theoretical controversies and lack of consensus regarding divergent addiction nomenclatures and conceptualisations (Cave *et al*. 2009; Borch & Rantala, 2015; Department of Social Protection, Substance And Drug Dependency, 2013), for the purpose of this review all conditions commonly viewed as a drug addiction, or involving the use of a substance in a manner associated with harm, were eligible for inclusion. Studies not available in English, or not providing MCRS outcome findings for conditions related to drug use, were excluded. This review did not consider unpublished raw MCRS data or studies still in progress.

Screening procedure

After studies retrieved electronically and from other sources were consolidated, all duplicate studies were removed. The titles and abstracts of all resultant studies were screened. Those studies that did not meet eligibility criteria were excluded. A full-text review of remaining studies was then conducted to determine eligibility. K.D. completed the initial screening procedure which was audited by M.P. (see Fig. 1 for a PRISMA flow chart representing the selection of eligible studies).

Data extraction

K.D. conducted the initial database searches and data extraction. The extracted information was completed according to a pre-determined checklist and included first author, publication date, country, setting, population, sample size(s), design, those factors (e.g. age, gender, year of study, and personal factors) examined as potential predictors of patient regard, key findings, and conclusions. This process was reviewed and confirmed by P.M.

Critical study quality appraisal and risk of bias assessment

As the quality of study findings are determined by potential biases, it is essential that systematic reviews evaluate the risk of bias in included studies (Higgins *et al*. 2011). Although the CRD PRISMA Statement (Moher *et al*. 2009) recommend using checklists to appraise study quality, other authorities (Liberati *et al*. 2009) caution against utilising checklists yielding summary scores. K.D. thus conducted the risk of bias assessment using Buckley *et al*.'s (2009) quality indicators, a process confirmed by M.P. This study appraisal system guided the study quality evaluation process and indicated potential areas of study bias (Higgins & Green, 2008; Hammer *et al*. 2009; Cochrane Handbook for Systematic Reviews of Interventions, 2016). The use of a formal appraisal system, also used in other recent allied reviews (van Boekel *et al*. 2013), facilitated an objective determination of potential bias and suggested the relative confidence to which findings considered in the final review could be accorded.

Data synthesis

The narrative synthesis was guided by Petticrew & Roberts' (2005) system. This included organising studies to frame the focus of enquiry, analysing the findings of each study, synthesising findings across all
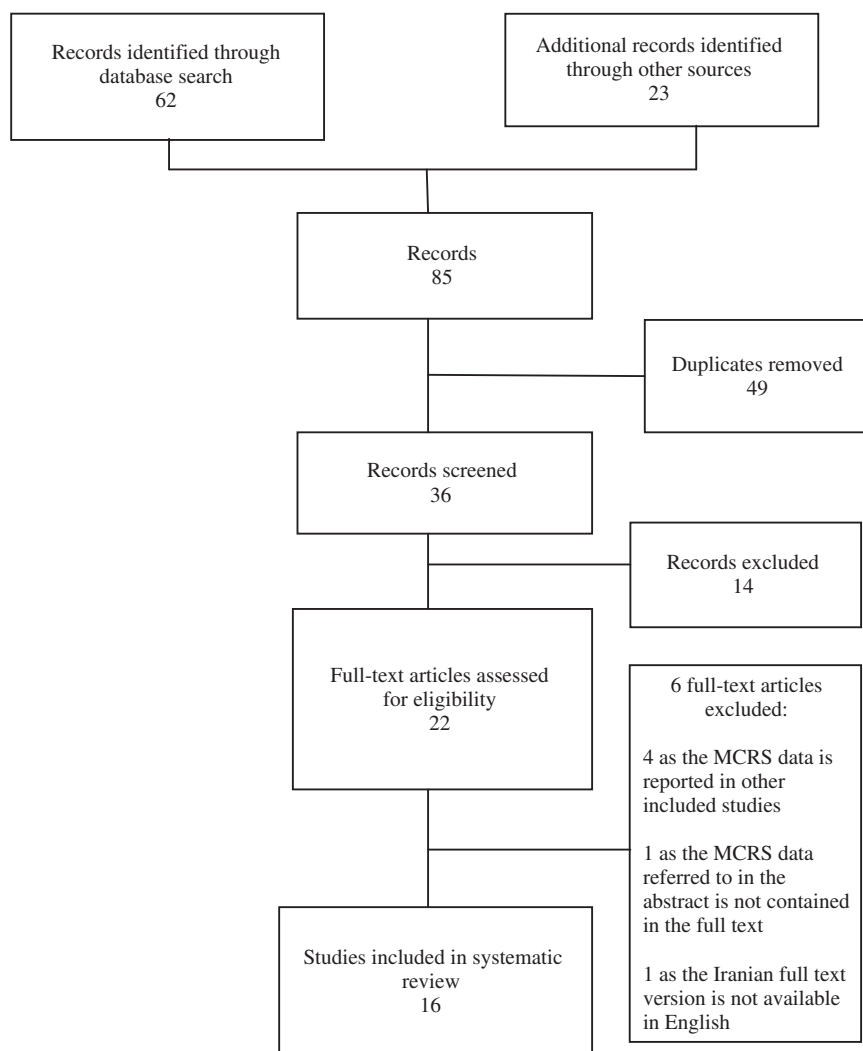
Fig. 1. PRISMA flow chart of selection of eligible studies, with reasons for full-text exclusion. MCRS, Medical Condition Regard Scale.

studies to produce a comprehensive summary of findings, and describing observations across studies. This process was also directed by references (Dixon-Woods *et al.* 2005; Greenhalgh *et al.* 2005; Mays *et al.* 2005; Green *et al.* 2006) recommending that the study summary characteristics, main findings, relationships within and between included studies, and possible explanations for these are reported by text or table. This activity focussed on answering the review question by consolidating and systematising MCRS outcomes registering health student regard for drug-using patients; establishing the consistency of such findings; considering the evidence for trends in these findings; as well as investigating possible relationships between regard and potential predictor variables reviewed. This approach was chosen given study heterogeneity in terms of population, design, context, and statistics reported (e.g. parametric *v.* non-parametric data).

Results

Search results

We identified 85 papers in the initial search of databases and from suggested citation provided by expert opinion (see Fig. 1). After removing 49 duplicates, we screened the titles and abstracts of 36 remaining studies. We then assessed the full text of 22 potentially eligible articles. After excluding six studies from a full-text review, a final 16 studies were included in the systematic review. Figure 1 presents a PRISMA flow chart providing a composite overview of the above process, with reasons for full-text exclusion.

Of the 16 observational studies employing MCRS outcome measures which were included in the final review, four studies (Christison *et al.* 2002; Christison & Haviland, 2003; Meltzer *et al.* 2013; Williams *et al.* 2015*a*) had a longitudinal component. One study recruited

Table 1. *Key study characteristics*

Study Source	Setting country	Sample (% female)	Design
Ahmedani *et al.* (2011) JA	University USA	71 medical students (58%) 75 social work students (86%)	Cross-sectional study
Boyle *et al.* (2010) JA	University AUS	548 undergraduate health students (81%)	Cross-sectional study
Brown *et al.* (2010) JA	University AUS	92 occupational therapy students (91.3%)	Cross-sectional study
Christison *et al.* (2002) JA	University School of Medicine USA	440 medical students followed by 163 medical students (no sex data provided)	Cross sectional with longitudinal follow-up
Christison & Haviland (2003) JA	University USA	134 medical students (no sex data provided)	Longitudinal
Korszun *et al.* (2012) JA	Medical student online survey UK	760 medical students (67%)	Cross-sectional study
Kubiak *et al.* (2011) JA	University USA	75 social work students (85%)	Cross–sectional study
Madhan *et al.* (2012) JA	Dental School India	212 dental students (no sex data provided)	Cross–sectional study
McKenna *et al.* (2011) JA	University AUS	52 midwifery students (100%)	Cross-sectional study
McKenna *et al.* (2012) JA	University AUS	106 nursing students (92%)	Cross-sectional study
Meltzer *et al.* (2013) JA	Academic Medical Centre USA	99 internal medicine residents (46%)	Prospective cohort
Williams *et al.* (2012) JA	Universities (*n* = 7) AUS	783 paramedic students (57.3%)	Cross-sectional study
Williams *et al.* (2013*b*) JA	University AUS	94 paramedic students (62.8%)	Cross-sectional study
Williams *et al.* (2013*a*) CP	University AUS	1793 paramedic students (57%)	Cross-sectional study
Williams *et al.* (2015*a*) JA	University AUS	554 paramedic or paramedic/nursing students (69.1%)	Prospective, cross-sectional, and longitudinal
Williams *et al.* (2015*b*) EJA	University AUS	230 paramedic and paramedic/nursing students (66.1%)	Cross–sectional study

JA, Journal Article; CP, Conference Proceedings; EJA, Electronic Journal Article.

students upon intake during the same month in four consecutive years (Williams et al. 2015b). Students canvassed included medical, dental, nursing, paramedic, occupational therapy, and social work students. Reviewed studies considered student regard for patients with drug conditions including non-specific substance abuse, SUD, intravenous (IV) drug use, dependence on narcotic medication, alcohol dependence, and nicotine dependence. Studies originated from Australia (*n* = 9), America (*n* = 5), the United Kingdom (*n* = 1), and India (*n* = 1). See Table 1 for the key characteristics of the included studies.

Study quality and potential bias

The quality of the included studies (14 from peer-reviewed journals, one from an electronic journal article, and one from a conference proceeding) was reviewed against Buckley *et al.*'s (2009) study quality indicators. Although all studies were of an acceptable quality, none were free from potential bias, especially given the trend towards single site projects, and the predominance of female respondents. Convenience sampling was pervasive among included studies making it difficult to control for participant distribution

trends. Participation response rates fluctuated greatly from 88% (Christison & Haviland, 2003) to 23% (McKenna *et al*. 2012). Some studies did not report participation response rates (e.g. Madhan *et al*. 2012; Williams *et al*. 2013*a*) albeit having relatively large sample sizes. The study objectives or research questions were clearly indicated in all studies. All participant target groups were relevant and appropriate given the research questions, as were the data collection methods used. As participant recruitment took part in appropriate domains (e.g. class rooms or online) there were unlikely to be artificial linguistic, health, cultural, or social status participation barriers contributing to selection bias. Given the data collection methods used; and that the MCRS is a brief, simple, and structured (paper or electronically based) instrument, risks of detection or information bias arising from inexact measuring of response data was minimal. Although not all authors included a statement of positionality, all reviewed studies discussed potential study limitations. Authors typically employed parametric methodologies though a minority (Brown *et al*. 2010; Madhan *et al*. 2012) elected to employ non-parametric measures. Conclusions made were congruent with presented data, and all studies could potentially be replicated. Studies which included a prospective or longitudinal component (Christison *et al*. 2002; Christison & Haviland, 2003; Meltzer *et al*. 2013; Williams *et al*. 2015*a*) collected follow-up data in a contemporaneous manner, thus reducing confounder risks produced by time lags between interventions and measurement of MCRS scores. Whilst all studies adhered to ethical standards, earlier studies were silent on the ethics committee application and approval process (Christison *et al*. 2002; Christison & Haviland, 2003). Other studies accepted the completion and submission of responses as satisfying implied consent (McKenna *et al*. 2011, 2012; Williams *et al*. 2015*a*, 2015*b*). See Table 2 for a synopsis of the major findings and quality factors of the included studies.

Regard for drug users

This review found substance-using patients were consistently held in very low regard by all health student groups canvassed. In 13 of the 16 (80%) studies reviewed, drug-using patients were the cohort held in lowest regard among all diagnostic groups considered. In six of the above studies, MCRS scores for drug-using groups were significantly ($p < 0.05$) lower than that for all other conditions considered. In those remaining studies in which a drug-use condition was not held in lowest regard, that is, lowest regard was held for somatoform conditions (Christison *et al*. 2002); patients with long-standing, unexplained abdominal

complaints (Korszun *et al*. 2012), and patients with a lesbian, gay, bisexual, transgender (LGBT) orientation (Madhan *et al*. 2012), it was the condition held in second lowest regard. Patients with drug-use conditions were thus held in either the lowest, or second lowest regard in all studies reviewed.

Sex

In all, 13 of the reviewed studies considered the role of respondents' sex on MCRS scores for drug-related conditions. A study of midwifery students (McKenna *et al*. 2011) had no male participants, and a nursing student study (McKenna *et al*. 2012) had <8% male respondents. In the remaining 11 studies, five found that female respondents held substance-using patients in higher regard than their male counterparts. Only two studies found these sex differences to be statistically significant (Korszun *et al*. 2012; Williams *et al*. 2015*a*). Six studies found no relationship between respondents' sex and level of regard for drug-using patients.

Student age

Seven of the eight studies, which considered student age as a predictor for patient regard found no relationship between age and MCRS score for drug-using patients. Kubiak *et al*. (2011) found younger age predicted lower regard for alcohol-dependent patients, whereas increasing age was associated with higher regard for nicotine-dependent patients.

Course year

Year of study was considered as a possible predictor for MCRS score in 12 of the reviewed studies. Eight studies found no such relationship existed. Boyle et al. (2010) found that third-year health students reported lowest regard for SUD patients. Brown *et al*. (2010) found second-year occupational therapy students had significantly higher ($p = 0.019$) median MCRS scores than first- or third-year students. Kubiak *et al*. (2011) found being in the second (advanced practice) year, rather than in first year, predicted low social work student regard for patients with alcohol dependence. Williams *et al*. (2015*a*) found that combined paramedic/nursing students had significantly higher ($p < 0.001$) regard for SUD patients by their third year of study. No such increases were found among students enrolled in the single (paramedic only) degree.

Personal factors

Three studies considered personal factors as predictors for MCRS scores. Korszun *et al*. (2012) found medical students with personal mental health difficulties had

Table 2. *Key findings and quality factors of included studies*

Study	Findings and conclusions	Study quality and potential bias
Ahmedani *et al.* (2011)	Medical and social work students were less willing to treat nicotine- and alcohol-dependent patients than patients with depression. No differences between medical or social work students regard for these drug-dependent patient groups were found. Personal history and age was not associated with willingness to treat. Men were less willing to treat all conditions	Anonymous online survey with use of randomised reinforcers to gain at some experimental control of non-participation bias. Limited to one university, larger percentage of younger female students, focus on less senior students, few health professions, and few medical conditions considered. Some evidence of non-participation bias
Boyle *et al.* (2010)	Substance-abusing patients were the patient group held in lowest regard by all health students. Lowest regard for this group was reported by midwifery students, males, and third year students	Limited by a convenience sampling methodology, limited data on distribution of students who declined to participate, possible 'volunteer' or participation bias, and a pre-dominance of female respondents, albeit representative of enrolment
Brown *et al.* (2010)	Regard for substance-abusing patient group was significantly lower ($p = 0.000$) than all other diagnostic groups. Significant ($p = 0.019$) drops in regard for substance-abuse patients were found among third year students. No significant age or gender differences in regard for substance-abusing patients were found	Convenience sample from one university, with no data available on students who declined to participate. Possible small over-representation of younger female students sampling methods limit generalisability of results
Christison *et al.* (2002)	Regard was highest for straightforward medical conditions and lowest for the somatoform conditions. Scores for alcohol dependence, severe emphysema from smoking and intravenous drug use were in the mid-to-low range, respectively. Over the course of a 6-week psychiatry clerkship regard for patients with alcoholism rose only among students who completed an addiction placement	No data correlating MCRS scores with actual behaviour change was available. Study phases were differentially weighted towards students in different years
Christison & Haviland (2003)	Alcoholism was the condition held in lowest regard during pre-clerkship. A significant ($p < 0.05$) increase in post-clerkship regard for these patients was observed. Changes in regard for those with alcoholism did not differ by gender, addiction site assignment, or psychiatry rotation. Mean regard scores increased significantly for patients with alcoholism following brief addiction treatment site placement, though not for control condition	No follow-up, so durability of effect is not known. Researchers controlled for potential confounding factors and incorporated a control condition (emphysema). No data correlating MCRS scores with actual behaviour change was available
Korszun *et al.* (2012)	Students reported lowest regard for patients with long-standing, unexplained abdominal complaints. IV drug users were the patient group held in second to lowest regard. Females had significantly ($p < 0.025$) higher mean regard for IV drug users than men. Personal experience, or having friends or family members with mental illness, was associated with significantly higher levels of regard for IV drug use, at $p < 0.005$ and $p < 0.001$ levels, respectively	Web-based survey limited information as to distribution trends of respondents. Risk of participation bias. Participation response rate not known
Kubiak *et al.* (2011)	Nicotine dependence was held in significantly ($p < 0.001$) lower regard than all other conditions. Alcohol dependence was held in second lowest regard though not statistically significantly so. Significant ($p < 0.05$) predictors for low regard toward patients with alcohol dependence included younger age and advanced practice year. No personal history of depression and younger age were significant ($p < 0.05$) predictors of low regard for nicotine-dependent clients	Generalisability may be limited by this being a single site study examining only one profession with a 64% participation rate
Madhan *et al.* (2012)	Dental student regard was largely positive for all the conditions except LGBT, which was borderline positive. Overall, substance abuse was the condition consistently held in second to lowest regard	A single site, single profession, convenience sample study limits generalisability of findings. No participation response data was provided. Risks of participation bias
McKenna *et al.* (2011)	Attitudes towards those medical diagnoses considered were positive with the exception of those towards clients with a diagnosis of substance abuse, which had a significantly ($p < 0.05$) lower mean regard score	Convenience sampling, single site study, and an absence of male participants limit generalisability of findings. Whilst gender participation was reflective of this university's enrolment, it may not be internationally representative. A large S.D. (11.67) suggests lower agreement on attitudes to substance abuse amongst participants

Table 2: (*Continued*)

Study	Findings and conclusions	Study quality and potential bias
McKenna *et al.* (2012)	Substance abuse was held in significantly ($p < 0.05$) lower regard than all other conditions	Convenience sampling contributing to participation bias, an uneven distribution of students across year levels, a single site study, a low response rate (23%), and a possible over-representation of females (<8% male) limited the study findings and generalisability
Meltzer *et al.* (2013)	Baseline MCRS scores indicated significantly ($p < 0.001$) lower regard for patients with alcoholism and those dependent on narcotic pain medication than for other conditions. These scores did not differ according to gender, prior addiction education, or year of training. Post-training MCRS scores increased marginally for patients with alcoholism and narcotic pain medication dependence. Changes in pre- and post-MCRS scores did not vary by gender or number of educational sessions attended	Possible role of a reactive pre-testing effect, also some students did not fully attend the training, and longer-term effects were not measured. Possible confounders and a positive test response set may have had an effect. No data correlating MCRS scores with actual behaviour change was available
Williams *et al.* (2012)	Patients presenting with substance abuse were held in lowest regard. Female students reported higher levels of empathy than their male colleagues did across each medical condition	Convenience sampling may contribute to participation bias. Relatively low participation rates
Williams *et al.* (2013*b*)	Regard was lowest for substance-abuse condition. No age or gender differences were noted	Convenience sampling contributing to risk of participation bias. Differences between MCRS scores for different conditions were not statistically significant, thus identifying trends only
Williams *et al.* (2013*a*)	Mean student regard scores were lowest for substance abuse. There were no statistically significant differences in MCRS scores between genders, though there was a statistically significant difference between mean scores for each medical condition across universities ($p < 0.0001$)	Convenience sampling contributes to risk of participation bias. The participation response and the representativeness of the sample are not known. Differences between MCRS scores for different conditions were non-significant, again thus identifying trends only. Participants were recruited from six Australian universities, thus promoting greater generalisability
Williams *et al.* (2015*a*)	Patients presenting with substance abuse were held in the lowest regard by students. Single (paramedic) degree students had lower regard than double degree (paramedic and nursing) students ($p < 0.0001$); first year students had the lowest regard and second years the highest regard ($p < 0.0001$) for this group. Double-degree (paramedic/nursing) students showed a significant ($p < 0.0001$) positive change towards patients presenting with substance abuse by their third year of study. Females had significantly higher regard ($p = 0.02$) for substance-abuse patients	Convenience sampling leading to risk of participation bias. A single-site study, albeit with a demographic profile comparable with other university sites. No data correlating MCRS scores with actual behaviour change was available
Williams *et al.* (2015*b*)	Students entering an undergraduate paramedic or paramedic/nursing course reported poor regard towards all conditions, though this was particularly evident for substance abuse. Across all four yearly intakes substance abuse ranked the most poorly in terms of MCRS scores. There were no significant differences noted between genders and age groups across any of the yearly intakes	Convenience sampling and single site study may limit generalisability. As only first year students were surveyed patterns and levels of regard levels throughout the degree were not determined. Findings were not statistically significant, suggesting trends only

MCRS, Medical Condition Regard Scale; IV, intravenous; LGBT, lesbian, gay, bisexual, transgender.

significantly ($p < 0.005$) higher regard for IV drug-using patients compared with those without. Similarly, medical students with a friend or relative treated for mental health problems had significantly ($p < 0.001$) higher regard for IV drug users than those without. Kubiak *et al*. (2011) found personal histories of depression, but not smoking or alcohol use, were significantly ($p = 0.05$) predictive of higher stigma levels towards nicotine-dependent clients. Conversely, Ahmedani *et al*. (2011) found personal histories (i.e. depression, tobacco smoking, or alcohol drinking) did not influence regard for either nicotine- or alcohol-dependent patients.

Training and placement experiences

Christison *et al*. (2002) found that over a 6-week psychiatry clerkship, MCRS scores for patients with alcoholism improved significantly ($p = 0.016$) among those students exposed to an addiction placement. A later study (Christison & Haviland, 2003) found a 1-week clerkship at an addiction treatment site significantly ($p < 0.05$) increased regard for patients with alcoholism. Meltzer *et al*. (2013) found that following an addiction training intervention internal medicine trainees' MCRS scores for patients with alcoholism and narcotic dependence increased marginally, though these changes did not vary by number of educational sessions attended.

Discussion

This review presents evidence to support the assertion that drug-using patients are the diagnostic group which are likely to be held in the lowest levels of regard by health students when this aspect of stigma is assessed using the MCRS. This tool is a valid, reliable, and utilitarian measure of positive or negative biases, emotions, and expectations; and specifically whether the conditions under review are considered to be enjoyable, treatable, and worthy of medical resources. A striking finding was that in 80% of the studies reviewed, drug-using patients were the group held in lowest regard among all diagnostic categories considered. Substance-using patients were the group held in second lowest regard in the remaining three studies (Christison *et al*. 2002; Korszun *et al*. 2012; Madhan *et al*. 2012), which all surveyed participants from 'biomedical' fields. In two of these studies (Christison *et al*. 2002; Korszun *et al*. 2012) medical students viewed patients with somatoform conditions (explained as frequent visits for many different symptoms with few physical findings) and patients with unexplained abdominal complaints in lower regard than drug-using patients, respectively. In the remaining study which found that dental students held LGBT patients in lower regard than drug users; a possible socio-cultural confounder in the form of Indian penal law which had possibly institutionalised sexually prejudicial attitudes, was identified by the authors (Madhan *et al*. 2012).

Low regard for a patient group can lead to poor communication and impaired therapeutic alliances, impact upon treatment delivery, contribute to treatment avoidance or interruption, as well as 'diagnostic overshadowing' (van Boekel *et al*. 2013). This can negatively affect the entire continuum of care from diagnosis, treatment, rehabilitation, and relapse prevention. As drug problems affect a substantial segment of the population and are especially prevalent in 'at risk' individuals who present for psychological and medical care (Miller & Brown, 2009), this persuasive demonstration of endemic low regard for a large sector of the patient community has major clinical, training, research, and policy implications.

The finding that substance-using patients were consistently held in very low regard by all student groups canvassed is of concern given the almost 30% lifetime prevalence rate of illicit drug problems and the expectation that most health professionals will operate in contexts wherein they will regularly encounter patients with drug-related challenges (European Drug Report, Trends and Developments, 2015). There are more deaths, illnesses, and disabilities recorded from substance abuse than from any other preventable health condition, with 25% of deaths being attributed to socially accepted or illicit drug use (Death, 2016). These figures do not include the cost of other illnesses and injuries; lost worker productivity; crime; family, relationship, and community conflicts; indirect fatal and disabling accidents; birth defects and other burdens arising from addiction, believed to inflict a greater toll on health and well-being than any other single preventable factor (McGinnis & Foege, 1993). Figures are more striking when it comes to opioid users, a group for whom 89% of all male deaths and 86% of female deaths are considered preventable (Degenhardt *et al*. 2014). Mindful of the societal prevalence, high levels of comorbidity, destructive synergies between SUD and other physical and psychological health conditions, as well as the documented benefits of available treatments (Gossop *et al*. 2003; Simpson, 2004; Li *et al*. 2010), it is thus most imperative that health students qualify without attitudinal impediments to treating drug users proactively and unwaveringly.

Kelleher & Cotter (2009) have noted that negative attitudes in relation to substance abuse can be linked back to a perceived education deficit in health care courses. The benefits of training interventions were likewise highlighted by those studies included in this review (Christison *et al*. 2002; Christison & Haviland,

2003) which found statistically significant changes in level of regard to SUD patients, even after relatively brief addiction placement opportunities. Many of the reviewed studies (Ahmedani *et al*. 2011; Kubiak *et al*. 2011; Korszun *et al*. 2012; Madhan *et al*. 2012; Williams *et al*. 2015*a*, 2015*b*) similarly suggested employing remedial educational or training interventions; curricula revisions; or an inclusion of disciplines like psychology (instead of a narrow focus on pathophysiology and biomedicine). Others suggested corrective professional socialisation (Meltzer *et al*. 2013) to modify the perturbing low levels of regard towards drug users uncovered.

Although positive attitude changes among medical students treating drug abuse has been achieved by substance-abuse courses that included patient contact (Chappel & Veach, 1987), further lessons may be learnt from attempts to decrease student stigma towards mental illness. A Canadian health care worker anti-stigma initiative found that contact-based education reduced prejudicial attitudes and improved acceptance of people with a mental illness across various groups and sectors (Stuart *et al*. 2014). Emphasising recovery and including multiple types of social contact were found to be the active ingredients of particular importance in effective anti-stigma programmes for health care providers (Knaak *et al*. 2014). A systematic review examining interventions that reduced mental health-related stigma in students found that social or video-based social contact seemed most effective in improving attitudes and reducing desire for social distance (Yamaguchi *et al*. 2013). In a review attempting to identify stigma-reduction interventions in the field of HIV/AIDS, mental illness, leprosy, TB, and epilepsy, Heijnders & Van Der Meij (2006) concluded such interventions should be multifaceted; target the intrapersonal, interpersonal, and community levels; and that a combination of counselling, education, and contact was very promising.

The results of this systematic review have underscored the need for future studies to evaluate the impact of interventions, which may reshape stigma-laden attitudes, beliefs, and feelings towards drug users during students' formative professional education and development. A policy-related suggestion arising from the above findings is the possible need for increased educational and patient-contact-based addiction-training opportunities for all health professionals. It is envisaged this is an area in which psychology, by virtue of its competencies in facilitating attitude and behaviour change, may have the most to offer. This need is particularly pronounced in Ireland given the prevalence of drug problems in this jurisdiction (European Drug Report, Trends and Developments, 2015).

Limitations

Although a possible strength of this study has been its ability to highlight the pervasive low regard held for patients with drug problems by health student using a measure of stigma that has sound psychometric properties, it is not without limitations. Process-related limitations include the fact that the database searches, screening of reference records, data extraction, and the risk of bias assessments were not conducted independently, or 'blindly', by both researchers to corroborate inter-researcher reliability. The data extraction and the risk of bias assessments were; however, cross checked, and both activities followed a predetermined data extraction checklist template, and a study quality appraisal system (Buckley *et al*. 2009), respectively. Notwithstanding these limitations, given the initial scoping exercise, correspondence with multiple international experts, the use of multiple electronic database searches, and that backward citation searches were conducted, it is improbable that any salient citations were excluded from the final review. Another process-related failing is that this review does not have a formal online accessible protocol or registration number, as suggested by PRISMA.

Content-related limitations to this review include the pre-dominance of Australian and to a lesser degree American studies, and the scarcity of European research. From a study bias perspective, included studies relied on convenience sampling methodologies, single site projects, and the pre-dominance of female respondents, which all culminated the attendant risk of participant biases. Participation rates of included studies also fluctuated greatly, and there is a risk reviewed studies may not be representative of, or generalisable to all health student environments. Exclusive reliance by included studies upon a 'self-report' measure of clinical bias also contributes to an increased risk of social desirability bias. The fact the MCRS is a subjective 'self-report' outcome measure, and as none of the included studies appeared to have access to an alternative, comparable, valid, reliable, one-dimensional measure of attitudinal bias, there were no cited attempts to triangulate MCRS scores with other psychometric measures of patient stigma, or with any pertinent clinical behaviours. This is an important consideration for future research, as meaningful divergences may exist between self-reported levels of biases and the actual behavioural expression, either covertly or overtly, of such attitudes within clinical situations. Similarly, as the MCRS is weighted towards students' enthusiasm and willingness to treat, and does not measure all other possible dimensions or facets of stigma, other salient attitudes such as perceptions of 'patient dangerousness' or an expression of a desire for 'social distance' (Ahmedani *et al*. 2011) were not

evaluated. The problems of selection bias, a reliance on self-reported outcome data, and the pressure of social desirability, which limited the quality and strength of included primary studies, is an acknowledged limitation in analogous systematic reviews which examined stigma among qualified health professionals (van Boekel *et al.* 2013).

Conclusions

There is current evidence to support the supposition that health students hold substance-using patients in the lowest level of regard, a bias or expectation that translates to a lack of enthusiasm and willingness to treat such patients, as well as a belief that such groups are not worthy of treatment resources. Upon qualification, and unless addressed, such negative attitudes are likely to detrimentally impact upon patient relationships and treatment activities. Low regard for patients, especially those with high-risk health profiles, is clinically undesirable. There is a need for Irish research to explore health students' attitudes towards SUD patients in this jurisdiction, and if necessary ascertain how unhelpful attitudes might be best moderated through those remedial intrapersonal, interpersonal, professional, and societal interventions that have an evidence base.

Acknowledgements

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 1975, as revised in 2008. As this is a literature review of existing studies, involving no human or animal experimentation, the authors assert that ethical approval for publication of this Systematic Review is not required by their local Ethics Committee.

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Appendix

Search string terms used for each database.

Initial foundation search string format

students AND (addiction OR alcohol OR drug OR substance) AND 'Medical Condition Regard Scale'

Analogous EMBASE search string format

students* AND (addict* OR alcohol* OR drug* OR substance*) AND 'medical condition regard scale' AND [2001-2016]/py.

Analogous PsycINFO (OVID) search string format

(student.mp. or exp Students/) AND ((addict*.mp. or exp Addiction/) OR (exp Alcohol Abuse/ or alcohol*.mp.) OR (exp Drug Dependency/or exp Drug Abuse/or exp Drug Addiction/or exp Intravenous Drug Usage/or drug*.mp.) OR (substance.mp.)) AND 'Medical Condition Regard Scale'.mp.

Analagous PubMed format

((students*) AND ((((addict*) OR alcohol*) OR drug*) OR substance*)) AND 'Medical Condition Regard Scale' AND (('2001/01/01'[PDat]: '2016/03/31'[PDat])).

Analogous PubMed Central search string format

((students*) AND ((((addict*) OR alcohol*) OR drug*) OR substance*)) AND 'Medical Condition Regard Scale' AND (('2001/01/01'[PDat]: '2016/03/31'[PDat])).

Analogous Scopus format

(ALL (students*) AND ALL (addict*) OR ALL (drug*) OR ALL (substance*) AND ALL ('Medical Condition Regard Scale')) AND PUBYEAR > 2001

Analogous Web of Knowledge (Web of Science) search string format

((students* AND (addict* OR alcohol* OR drug*OR substance*) AND 'Medical Condition Regard Scale'))