
Characteristics, Predictors and Reasons for Regulatory Body Disciplinary Action in Health Care: A Scoping Review

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ABSTRACT: What research has been done to characterize the outcomes of disciplinary action or fitness-to-practice cases for regulated health professionals?

To answer this research question, relevant publications were identified in PubMed, Ovid EMBASE, CINAHL via EBSCOhost, and Scopus. Included papers focused on reviews of regulatory body disciplinary action for regulated health professionals.

Of 108 papers that were included, 84 studied reasons for discipline, 68 studied penalties applied, and 89 studied characteristics/predictors of discipline. Most were observational studies that used administrative data such as regulatory body discipline cases. Studies were published between 1990-2020, with two-thirds published from 2010–2020. Most research has focused on physicians (64%), nurses (10%), multiple health professionals (8.3%), dentists (6.5%) and pharmacists (5.5%). Most research has originated from the United States (53%), United Kingdom (16%), Australia (9.2%), and Canada (6.5%). Characteristics that were reviewed included: gender, age, years in practice, practice specialty, license type/profession, previous disciplinary action, board certification, and performance on licensing examinations.

As most research has focused on physicians and has originated from the United States, more research on other professions and jurisdictions is needed. Lack of standardization in disciplinary processes and definitions used to categorize reasons for discipline is a barrier to comparison across jurisdictions and professions. Future research on characteristics and predictors should be used to improve equity, support practitioners, and decrease disciplinary action.

Introduction

In order to protect the public and ensure safe and quality care, health professionals are usually regulated by the government or through self-regulation, where the government has given the profession the responsibility to regulate themselves.^{1,2} Forms of regulation vary across jurisdictions, but typically regulatory bodies register and license health professionals and set standards of practice.^{2,4} Regulatory bodies also handle complaints and concerns about clinical incompetence or professionalism, where the highest level of sanctioning at the regulatory body level is through the disciplinary action process. While administrative databases of disciplinary action cases provide a wealth of information, it is unclear what research has been conducted about disciplinary action cases.

This review was conducted to describe and characterize research on regulatory body disciplinary action for health professionals, specifically reasons for disciplinary action, penalties applied, and characteristics of health professionals subject to disciplinary action. Our original research question was: What

research has been done on disciplinary action or fitness-to-practice proceedings for regulated health professionals? However, we found that a large number of publications that fit our inclusion criteria focused on socio-legal aspects of health professional regulation, such as policy and disciplinary action processes or critiques of fitness-to-practice processes.⁵⁻¹¹ Thus, we narrowed our research question to: What research has been done to characterize the outcomes of disciplinary action or fitness-to-practice cases for regulated health professionals?

Methods

The framework proposed by Arksey and O'Malley was used for this scoping review.¹² A systematic review searches the literature for the research on a specific, well-defined question, typically including only studies with a specific research design or quality. In contrast, a scoping review uses a broader lens to identify research that has been conducted in a particular area, which can be valuable to identify gaps in literature, to assess the value of conducting a full systematic review, and to summarize research across multiple types of study designs. Original

research papers or review articles in English were included if they focused on reviews of regulatory body disciplinary action cases for health professionals to determine reasons for disciplinary action, penalties applied, predictors of disciplinary action or characteristics of professionals that are subject to disciplinary action. Qualitative research and publications related to socio-legal analyses such as the implications of policy on the disciplinary action process were excluded. Papers were excluded if they focused on disciplinary action for unregulated health professionals (e.g., personal support workers) or veterinarians, if the disciplinary action was not administered by the regulatory body (e.g., organizational disciplinary action or legal malpractice cases), or if the publication was a report of a regulatory body disciplinary case. Papers concerning regulatory body practices related to maintenance of competence or quality assurance were excluded in order to focus on research related to disciplinary action.

Relevant articles were identified in PubMed (1950–present), Ovid EMBASE (1980–present), CINAHL via EBSCOhost (1982–present) and Scopus (1966–present). These databases were chosen to capture relevant articles in medicine and allied health. Search strategies were drafted by an experienced librarian and a researcher, and the final searches were conducted on June 5, 2020. The search strategies were comprised of subject headings (MeSH) and keywords related to “healthcare professionals” and “disciplinary action.” Search terms were gathered by reviewing the vocabulary of select relevant articles, as well as database thesauri. As an example, the final PubMed search strategy is included in Appendix A.

Database results were imported directly into Covidence (Veritas Health Innovation, Melbourne, Australia). Duplicates were identified and removed by the software, and one researcher reviewed the duplicates for accuracy. Articles were also manually screened for duplicates. Screening was conducted independently by two researchers and occurred in two stages—title and abstract, and full-text. At each stage, disagreements were resolved by discussion and agreement was calculated using Cohen’s Kappa.

A data extraction form using Google Forms was drafted (Appendix B). To refine the data extraction form, two researchers independently extracted data from 20 full-text articles, with discussion and refinement occurring after 10 cases and again after 20 cases. Data extraction for the remaining

cases was conducted independently, with comparison and consensus occurring at the end. Data was organized using Microsoft Excel (Version 16.43). We grouped studies by type of health professional, and summarized the reasons for discipline, characteristics of those disciplined, and study design.

Results

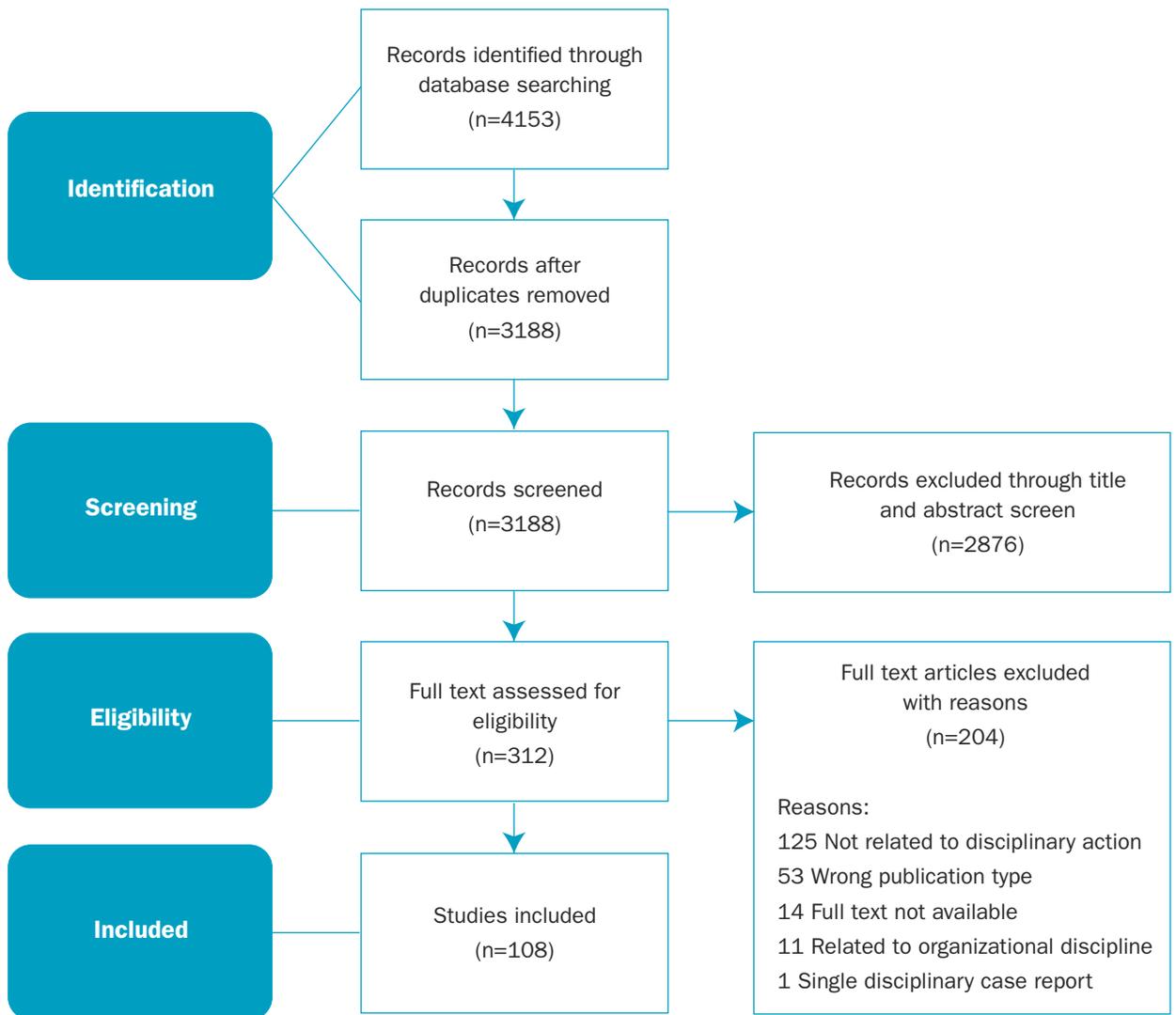
A total of 4,153 studies were obtained after searching the databases. After removing duplicates, 3,188 articles were screened at the title and abstract stage and 312 articles were screened at the full-text stage. We included 108 studies in the final extraction and analysis (Figure 1).¹³⁻¹²⁰ Using Cohen’s Kappa, inter-rater reliability for the title and abstract screening was calculated to be 0.564, indicating moderate agreement, and for the full-text screening stage was calculated to be 0.757, indicating substantial agreement.¹²¹

Characteristics and key findings of each study are described in Appendix C.* Studies were published between 1990 to 2020, with 67% of studies (72/108) published from 2010 to 2020 (Figure 2). Most available research has been conducted in the USA (n=57, 53%), followed by the United Kingdom (n=17, 16%), Australia (n=10, 9.3%), Canada (n=7, 6.5%), and Denmark (n=4, 3.7%). Most publications focused on medicine (n=69, 64%), followed by nursing (n=11, 10%), multiple health professions (n=9, 8.3%), dentistry (n=7, 6.5%), and pharmacy (n=6, 5.6%). Some papers included multiple health professionals regulated under the same body, such as physicians and osteopaths under the same board of medicine; these cases were counted as one profession.

Studies examined any or all of the following: reasons for disciplinary action (84/108 studies, 78%), characteristics and predictors of those subject to discipline (90/108, 83%), penalties applied (68/108, 63%), and rates of disciplinary action (41/108, 38%). Most studies (n= 94, 87%) were observational studies which were largely retrospective cohort studies using administrative data such as regulatory body disciplinary action cases or federal databases of disciplinary action cases. An additional six (5.5%) publications were observational research combined with another type of research, such as qualitative, a review, a questionnaire, or analysis. Other study types included reviews (n=4, 3.7%),

*Note to readers: Due to the length of Appendix C, which totals more than 45 pages, it is not included in the print version of this edition of *JMR*. A link to an online-accessible version of the appendix is included at the end of this article.

Figure 1
PRISMA Flow Diagram of Included Studies



qualitative research (n=3, 2.8%), and surveys (n=3, 2.8%), which were typically older studies likely conducted before disciplinary action cases were available online.

Common reasons for disciplinary action

Reasons for disciplinary action were considered in 84 of the 108 studies (78%). Most studies reviewed all possible reasons for discipline in a profession or in multiple professions, while some studies investigated one or a few specific types of violations, such as improper prescribing of narcotics, diversion, or impairment,^{31,32,53,63,64,77,78,113} online professionalism,^{49,84} or sexual misconduct or boundary violations.^{13,14,37-39,58,63,76,95,103}

Papers categorized reasons for discipline differently and often in broad categories, with little to no standardization in the definition of these categories. This limited the ability to determine the most to least common reasons. However, commonly cited reasons for discipline included clinical incompetence or standard of care issues, fraudulent financial practices, sexual misconduct, criminal conviction, alcohol or drug use/health impairment and unethical prescribing. Of the 84 studies looking at reasons for discipline, 52 (62%) focused on medicine and osteopathy, 11 (13%) on nursing, 6 (7.1%) on various health professions, 7 (8.3%) on dentistry, 4 (4.8%) pharmacy, and 1 (1.2%) each for psychology, social work, chiropractic medicine, and optometry/opticianry.

Penalties

Of 108 studies, 68 (63%) studied the types of penalties administered by the disciplinary body. Most papers that studied penalties analyzed one or more reasons for discipline and/or characteristics and predictors of disciplinary action. Some studies looked at factors related to the type of penalty administered, such as whether certain characteristics or predictors were associated with a higher risk of receiving a certain type of penalty,^{16,17,28,41,44,54,56,62,67,73-75,79,80,89,93,94,98,101-103} whether the type of violation affected the penalty,^{28,34,39,70,71,80,100,119} or whether the presence of certain aggravating or mitigating factors affected the penalty.^{42,43,45,46,103} Two studies assessed effectiveness of penalties on rates of reoffending.^{27,65} Most papers studied penalties as a whole, commenting on the most and least commonly applied penalties in the sample,^{13-19,24,28,29,31,32,34,36,37,40,41,47-50,57,61-63,65,69,70,72,74,76-78,80,82,84,88,93,98,101-103,106,108,112,113,118,119} while some papers looked specifically at one type of penalty and the types of cases that led to such a penalty, such as license revocation,^{19,26,34} or remediation.¹¹⁸

The types of possible penalties were similar across studies, and included formal reprimands, fines, paying the costs of the investigation, publication of the case details or outcome, conditions or

limitations applied to the health professional's license to practice, temporary license suspension, and license revocation (i.e., permanent loss of a license to practice, also referred to as license cancellation or erasure).

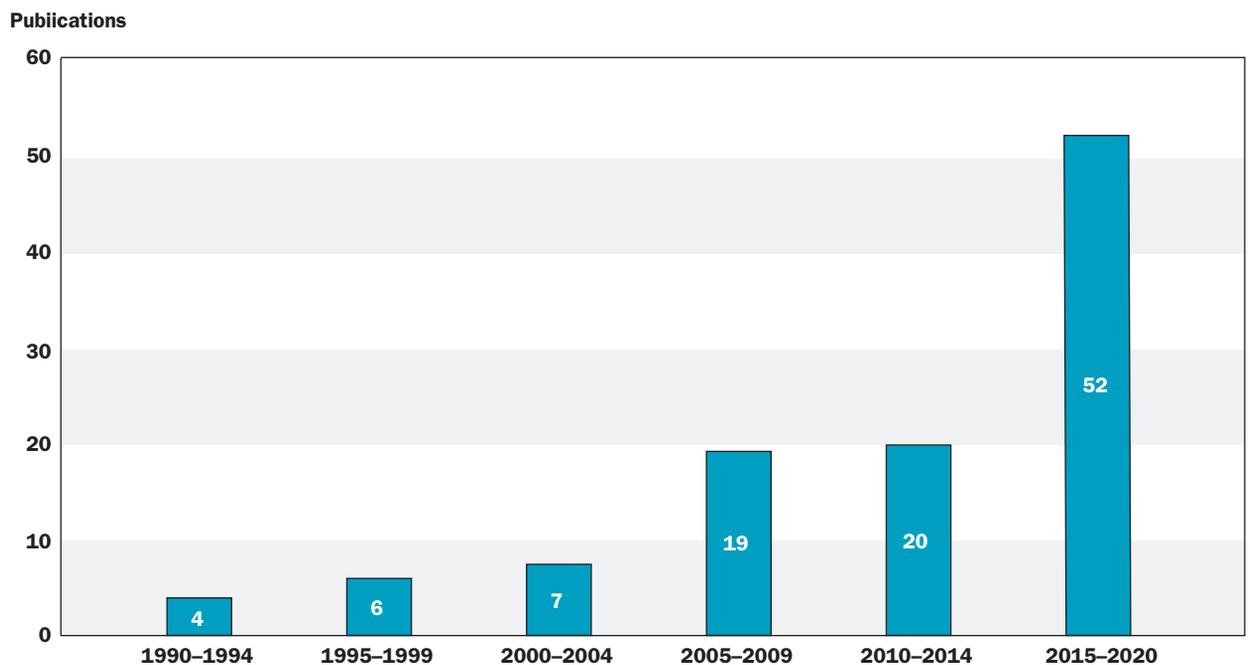
Characteristics and predictors of disciplinary action

Of 108 studies, 90 (83%) described one or more characteristics or predictors of disciplinary action. Characteristics and predictors researched included gender, age, years in practice, practice specialty, country of entry-to-practice education, board certification and maintenance of certification, performance on the licensing exam, license type (e.g., advanced practice nurse/nurse practitioner, registered nurse, licensed practical nurse), whether or not they had previous or repeated disciplinary action, and other (e.g., source of complaint, race/ethnicity). Overall, gender, practice specialty, years in practice, and license type were the most commonly studied. Characteristics and predictors are described below.

Gender

Fifty-nine of 108 publications (55%) considered gender as a risk factor for disciplinary action. Across professions, 41 publications found that

Figure 2
Publications on Disciplinary Action Outcomes Over Time (N=108)



male gender increased risk of disciplinary action.^{14,15,17-19,24,25,27-29,33,36,38,48,54,56,61,62,66,69,74,75,79,80,88,91,93,94,98,102,106-112,116,118-120} Twelve studies reported that most cases in the study were against males, but did not compare the proportion of males disciplined to the proportion of males in the general workforce for that profession.^{16,34,39,41,57,76-78,89,95,113} Five studies found no difference between male and female gender as a risk factor for discipline.^{22,26,87,101,103} Some studies from nursing found that more women were disciplined overall,⁵⁸ but that more men were disciplined when compared to the proportion of males in the workforce.^{48,54,88} One study in the United Kingdom found that more cases relating to social media involved female dentists than male dentists,⁸⁴ and another study found that while women were less likely to be disciplined overall, women were more likely to be disciplined severely.⁸⁰

Age

Twenty-nine of 108 studies (27%) considered age as a predictor of discipline. For physicians, disciplinary risk increased with age, with highest risk between ages 40-59.^{13,19,33,37,38,67,69,77,78,89,91,102,106} Two studies on multiple professionals found risk increased with age, with those aged 56-65 having the highest risk,^{94,98} and one study on pharmacists found no difference with age.⁹⁰ Regarding age at initial registration, one study found a higher risk of discipline for those who were 30 or older when they finished their training,⁷⁵ but another study found lower risk of discipline for clinical concerns for those who were older at registration.¹⁰⁷ Higher risk of a complaint with older age at registration but lower risk for a disciplinary critique was identified in one study.²⁰ Another study found older doctors to be more likely to have a lack of insight into the problem and less likely to change their practice.⁶⁵

In nursing, five studies found that disciplined nurses have an average age ranging from 43-51.5 years,^{48,54,58,61,118} and one review article identified a range of 20-76 years.⁸⁸ Associations with younger age were found in some nursing studies, where one study found the average age of discipline to be 37 years, which was lower than the average age (43 years) of the nursing population in that study.²⁷ Another study found nurses who recidivated to be three years younger than those who did not and were more likely to recidivate if less than 40 years.¹¹⁸ Certain violations were found to be more common in those of a younger age, such as more cases of chemical dependence in those aged 25-37,¹¹¹ and more cases of sexual misconduct in those aged 25-54.¹⁴

Years in practice

Twenty-nine of 108 papers (27%) considered years in practice as a predictor of discipline. Research on years in practice is conflicting. For physicians, 10 studies^{22,24,25,26,56,62,80,109,112,116} and one review article⁹¹ reported increased risk of disciplinary action with more years in practice or reported a higher proportion of physicians disciplined if they had more years in practice. In contrast, one study found disciplined physicians significantly more likely to be practicing fewer than 20 years at time of discipline.²⁸ Ten studies reported an average number of years in practice before a disciplinary case for various specialties or for physicians in general, ranging from to 11 years to 33 years.^{15-17,20,29,34,36,74,85,113}

Nurses appear to be disciplined sooner after graduation than physicians. One study reported an average of 12 years in practice before first discipline,⁶¹ another study reported that 60% of nurses were

A SYSTEMATIC REVIEW SEARCHES THE LITERATURE FOR THE RESEARCH ON A SPECIFIC, WELL-DEFINED QUESTION...IN CONTRAST, A SCOPING REVIEW USES A BROADER LENS TO IDENTIFY RESEARCH THAT HAS BEEN CONDUCTED IN A PARTICULAR AREA.

disciplined within the first 10 years of practice,¹¹¹ and a review article also found an average of 12-14 years before first discipline.⁸⁸ One study reported that nurses usually had more than six years' experience but had also recently changed employment or practice area within a year of the incident leading to disciplinary action.⁴⁸

Practice specialty

Forty-two of 108 papers (39%) included practice specialty as a risk for disciplinary action. Across 22 studies on physicians, the specialties of family medicine, psychiatry, obstetrics/gynecology, general practice, surgery, and anesthesiology were found to have a higher risk of discipline.^{15,17,25,26,28,34,36-38,50,56,57,63,76-78,80,86,87,91,95,113} Lower risk was found with radiology,⁶⁹ pediatrics,⁶⁹ internal medicine,⁶² and cardiology,⁶² and one study found no association with specialty.¹⁹

Two studies found that anesthesiologists were less likely to be disciplined than other specialties,^{16,24} but one study found anesthesiologists at high risk for addiction,⁶⁴ and another found them more likely to be disciplined for alcohol and drug offenses.²⁵

Risk has also been studied for subspecialties. Of physical medicine and rehabilitation physicians, the highest disciplinary risk was seen in those who had a subspecialty in pain.⁶⁶ Among internal medicine physicians, highest risk was seen among general internal medicine, then cardiology, and less risk with rheumatology, endocrinology, respiratory, gastroenterology, hematology, and medical oncology.⁷⁴

Among nurses, those in medical-surgical nursing were disciplined the most, with other higher risk specialties including geriatrics and long-term care, anesthesia, critical care, and emergency.^{48,111} Another study found long-term care nurses to be disciplined disproportionately more compared to the number of long-term care nurses in the general population.¹¹⁸

Board certification

Seventeen of 108 papers (16%) focused on board certification. All 17 papers considered physicians and found that certification decreased risk of disciplinary action compared to non-board-certified physicians. Specialties studied included anesthesiology,¹²⁰ emergency medicine,⁸³ family medicine,⁸⁹ general surgery,⁵⁹ internal medicine,^{73,75,85} orthopedics,⁶⁸ physical medicine and rehabilitation,^{66,67} psychiatry⁹¹ and physicians in general.^{28,33,62,69,80} Studies also found that those who passed the certification exam on the first attempt had lower risk of discipline than those who required multiple attempts.^{59,66,75,83,85} Risk was also lower for those whose certification never lapsed, while those who let their certification expire before recertifying had a higher risk of discipline.^{67,75,83,89} Those who had been in practice for a longer duration since completing their mandatory specialist training also had a higher risk of discipline.²⁰ Scores on certification exams were associated with discipline risk, with lower scores having a higher risk of future disciplinary action.^{66,67,75,85} Board-certified physicians also were less likely to receive a severe penalty and more likely to receive a less severe penalty.^{33,67,73,75,89} One study found that higher scores on the board certification exam reduced the likelihood of disciplinary action for both domestic and international graduates, but that it was more protective against disciplinary action for domestic graduates than for international graduates.⁸⁵

Performance on licensing exam

Performance on licensing examinations was considered in six of 108 publications (5.6%). Four studies^{29,87,93,112} and a review article³³ found that higher licensing examination scores or mandatory post-graduate examination scores were associated

with a lower risk of future discipline for physicians and osteopaths. In nursing, one publication studying characteristics of nurses disciplined for chemical dependency found that 2/35 nurses failed the licensing exam on the first attempt, but no further conclusion was made by the authors.¹¹¹

International entry-to-practice education

Twenty-six of 108 papers (24%) considered international entry-to-practice education. Research on whether being an international graduate increases risk of future disciplinary action is conflicting. Nine studies^{15,16,24,35,62,66,69,109,112} and two review articles^{33,91} found that international graduates were at higher risk of disciplinary action than domestic graduates, and one found an increased odds ratio for discipline with overseas training but it was not statistically significant.⁹⁰ Another study found that international graduates were more likely to receive high impact decisions in every stage of the disciplinary process and were more likely to be suspended or have their license revoked.⁵⁶

However, six studies^{25,26,28,83,89,119} found that international graduates were not at higher risk of disciplinary action, and one study found that notifications against internationally-trained psychologists were more likely

ACROSS PROFESSIONS, 25 OF 108 PUBLICATIONS CONSIDERED PREVIOUS DISCIPLINARY ACTION OR MULTIPLE VIOLATIONS AS A RISK FACTOR FOR FUTURE DISCIPLINE.

to result in further investigation but not more likely to have disciplinary outcomes or conditions applied.¹⁰² One study found no association between place of education and risk of a complaint.²⁰ A few studies collected information on international medical graduates but did not compare discipline rates or risk to domestic graduates.^{17,57,74,107}

License type/profession

License type within a profession (e.g., registered practical nurse, registered nurse, or nurse practitioner) was studied in 31 of 108 papers (29%). License type was associated with discipline, where those with less education were more likely to be disciplined. Among nurses, six papers found that licensed practical nurses or licensed vocational nurses were at highest risk of discipline compared to the general nurse population, followed by associate degree or diploma nurses, and then nurses who

had earned a bachelor's degree.^{14,27,48,58,61,118} Advanced practice registered nurses were the least likely to be disciplined, but among this group, nurse practitioners were at highest risk for discipline and certified registered nurse anesthetists were at lower risk.⁵⁵ Studies that did not compare rates of discipline to the general nurse population found that most cases concerned registered nurses,^{54,88,111} which makes sense given the proportion of registered nurses in the nurse workforce. An exception to this was a study in dentists, which found that dentists had the highest rate of complaints compared to allied dental professionals and to other health professions.¹⁰⁶

Compared to allopathic physicians, osteopaths had a higher risk of discipline,²⁵ non-significant higher risk of revocation,²⁶ and higher risk of discipline for sexual misconduct.^{37,95} Among pharmacists, one study found that pharmacy technicians were more likely to divert medications than pharmacists; the authors attributed this to the relative investment in the profession, with technicians having less educational and financial investment than pharmacists and therefore were more likely to divert overall.³²

Three papers compared discipline rates between professions: One found that most cases involved doctors, nurses, and pharmacists;¹⁰¹ one found that chiropractors had a higher rate of complaints than osteopaths and physiotherapists;⁹⁴ and one compared the rate of discipline based on the number of practitioners for each profession, finding that dentists had the highest rate, followed by doctors, while nurses and midwives had the lowest rate.⁹⁸ One study looking at consensual sexual misconduct cases found that nurses had the most cases, followed by doctors, then psychologists, which mirrored the general health practitioner workforce.¹⁰³ Another study on sexual misconduct found that osteopaths and podiatrists had higher risk than allopathic physicians.³⁹

Previous disciplinary action

Across professions, 25 of 108 publications considered previous disciplinary action or multiple violations as a risk factor for future discipline. Seven studies found that most discipline cases involved multiple violations or repeated charges.^{24,33,40,66,80,87,92} Previously disciplined physicians were more likely to be subject to future discipline than physicians who have never been disciplined,⁴⁷ and one study found higher risk of license revocation with two or more previous actions compared to one previous action.²⁶ Seven papers reported on the rate of discipline for physicians in general or certain

specialties who had been previously disciplined, ranging from 8% of physicians to 45.5%.^{15-17,28,57,89,113} In two pharmacist studies, 18% and 20% of pharmacists were disciplined more than once,^{90,108} and five studies of nurses reported rates ranging from 6.6% to 39% with an average of 23%.^{27,54,58,61,118} In a study reviewing multiple health professionals, 8.7% of guilty findings involved previously disciplined practitioners.¹⁰¹

Factors associated with recidivism for nurses included previous criminal conviction, multiple violations, younger age, male gender, and being a licensed practical nurse.¹¹⁸ One study found that the most common reason for recidivism among nurses was alcohol and drug problems, and that there was a higher recidivism rate if there were less conditions placed on the license or if suspension was not given as a penalty.²⁷ For physicians, risk factors for repeated discipline include noncompliance with conditions on license,¹⁹ younger age,^{53,63} longer time since offense,⁶³ lack of insight⁶³ and being disciplined for drug abuse.⁵³ One study found that most repeat offenders were male, independent

FOR PHYSICIANS, RISK FACTORS FOR REPEATED DISCIPLINE INCLUDE NONCOMPLIANCE WITH CONDITIONS ON LICENSE, YOUNGER AGE, LONGER TIME SINCE OFFENSE, LACK OF INSIGHT AND BEING DISCIPLINED FOR DRUG ABUSE.

practitioners, and practiced in the specialties of family medicine, psychiatry, surgery, and obstetrics/gynecology.⁵⁷ Decreased risk was found with a one-off, isolated incident and feeling of remorse by the clinician.⁶³

Rate of disciplinary action

Forty-one of 108 studies (38%) reported on rate of complaints or disciplinary action. Discipline rates overall across professions were low. Metrics used to report rates differed and included a percentage of practitioners,^{15,16,28,29,44,61,62,67,75,80,83,85,86,89,92,93,102,108,117,120} number of cases per 1,000 or 10,000 practitioners,^{19,30,36,40,41,52,98} number of cases per 1,000 practitioner-years,^{35,74,119} or cases per practitioner per year.¹⁷ Studies found that less than 1% of osteopaths were disciplined,⁹³ less than 2% of psychologists,¹⁰² 0.001% to 1.8% of pharmacists,^{44,108} and 0.19% of nurses.⁶¹ Some studies found variation across jurisdictions within the same country, such as U.S. dentists (ranging from

0.35 cases per 1,000 dentists to 19.20 cases per 1,000 dentists),³⁰ and U.S. physicians (ranging from 1.74 to 10.27 cases per 1,000 physicians).⁵²

For physicians, 28 studies reported discipline rates. Discipline rates overall were low. Of those reporting discipline as a percentage of physicians over time, rates ranged from 0.06% to 7% of physicians per year, with an average of 2.24%.^{15-17,20,28,29,62,67,75,80,83,85,86,89,117,120} One study reviewing multiple health professionals from Australia found an overall rate of 6.3 notifications per 1,000 practitioners per year, but varied between professions with dentists having the highest rate of notifications (20.7 notifications per 1,000 practitioners per year), followed by doctors at 14.5, pharmacists at 6.8, and nurses and midwives with the lowest rate at 2.0.⁹⁸

Studies across professions reported an increase in discipline cases over time,^{27,36,61,79,99,101} but one study in dentistry reported no difference in percentage of sexual misconduct complaints over the five-year study period.³⁹ Possible reasons for increases in discipline rate include an increase in the health practitioner workforce over time,¹⁰¹ change in disciplinary action structure,¹⁰¹ targeting of certain violations,^{19,79} change in board composition,¹⁹ and changes in laws resulting in more cases being heard by disciplinary boards.⁹⁹

Discussion

This scoping review describes the research that has been done to characterize the outcomes of disciplinary action or fitness-to-practice cases for regulated health professionals. Many studies have focused on reasons for discipline and various characteristics and predictors associated with discipline. Overall, included publications highlighted that the following characteristics were associated with discipline: male gender, older age, more years in practice, certain physician specialties, license type, previous disciplinary action, lack of board-certification, and poor performance on licensing examinations. However, research for these characteristics was not always in agreement. Most research has focused on physicians and originates from the United States. As most research has been done in the last 10 years, this review has highlighted the increased interest in this research area. However, variation in discipline processes and a lack of standardized definitions continue to make comparisons difficult.

This review adds to the literature on regulatory body disciplinary action because it includes multiple professions and jurisdictions, and broadly looks at reasons for discipline as well as characteristics and

predictors of discipline. While Papinaho et al.'s integrative review identified studies from four countries, it focused on nurse disciplinary action only.⁸⁸ Unwin et al.'s systematic review focused on how medico-legal action differs with gender,¹¹⁰ and Reich and Maldonado reviewed malpractice and regulatory body discipline for psychiatrists only.⁹¹ Other publications have reviewed disciplinary action for multiple health pro-

THE FOLLOWING CHARACTERISTICS WERE ASSOCIATED WITH DISCIPLINE: MALE GENDER, OLDER AGE, MORE YEARS IN PRACTICE, CERTAIN PHYSICIAN SPECIALTIES, LICENSE TYPE, PREVIOUS DISCIPLINARY ACTION, LACK OF BOARD CERTIFICATION, [AND] POOR PERFORMANCE ON LICENSING EXAM.

fessions but focus on one jurisdiction.^{98,114} In contrast, our review takes the broadest lens looking at multiple factors and professions across multiple jurisdictions.

Creation of a profile of characteristics such as gender, age, or ethnicity to identify those who are at risk of being subject to discipline is tempting, but discipline is rare. Most practitioners that fit these characteristics do not go on to offend, and such a checklist could drive discrimination and may in fact be more reflective of systemic bias.³³ Aside from characteristics and predictors related to health professionals themselves, discipline is also influenced by each jurisdiction's disciplinary action process, health care system, educational model, licensing requirements, quality assurance requirements, and culture. Interplay between these predictors and societal factors needs to be understood in order to address these risk factors and to interpret the usefulness of research on predictors of disciplinary action.

For example, many researchers have concluded that men are more likely to be disciplined than women, although the reasons behind this are not clear. In their systematic review and meta-analysis, Unwin et al. determined that this difference was not due to more males in the physician workforce. Possible reasons for the difference include differences in how genders are treated by the public or the regulator, or differences in work patterns, as female doctors are more likely to work part-time and see less patients than men, which could decrease overall patient encounters and the risk of disciplinary action.^{109,110} Some researchers attribute the difference in risk across genders to communication differences,^{74,109} where females spend more time with

each patient and are more engaged with patients in conversation, decision-making, and partnership-building.¹⁰⁹ Future research could investigate the possible reasons behind the difference in risk for discipline across genders, such as greater emphasis on communication in undergraduate training.

One particular area of controversy is whether international education increases the risk of disciplinary action. Of the 25 studies that identified this, all were conducted in Western countries and typically compared domestic graduates to international graduates as a group. In a few studies, a small number of countries were grouped together and compared to international graduates, such as the European Union or Canada and the United States. One study profiled risk according to country of qualifying education, highlighting that countries with higher risk than domestic

FUTURE RESEARCH COULD INVESTIGATE THE POSSIBLE REASONS BEHIND THE DIFFERENCE IN RISK FOR DISCIPLINE ACROSS GENDERS, SUCH AS GREATER EMPHASIS ON COMMUNICATION IN UNDERGRADUATE TRAINING.

Australian graduates were from non-Western countries.³⁵ Another study found that both doctors qualifying within the European Union and outside the European Union were more likely to receive a high-impact disciplinary decision than domestic United Kingdom graduates.⁵⁶ These studies are an opportunity to highlight systemic racism and the barriers that minorities and immigrants experience. Differences in discipline rates could be due to cultural differences, English not as a first language, differences in health systems, and communication skills—for example, the ability to explain clinical decision making, deescalate a situation, or apologize to a patient.^{35,56}

It is possible that a systemic bias is at the root of the increased rates of international graduates in certain countries on the patient/client side who report to the regulator, or on the side of the disciplinary committee who may use international training as a predictor to prompt closer scrutiny of a practitioner. A 2019 study on organizational discipline processes in the National Health Service organizational found that Black, Asian, and minority ethnic staff were overrepresented in disciplinary action.¹²² This was attributed to a number of factors, including a closed organizational culture that was not easily challenged, lack of cultural competence in senior staff, unfair decision making, lack of

support for those undergoing disciplinary action, lack of standardized application of disciplinary processes, and disciplining staff that had attitudes or behaviors that deviated from the norm even if there was not a performance issue.¹²² This study highlights that many factors aside from personal characteristics affect disciplinary action. With the significant focus on systemic racism throughout multiple institutions in society, this is perhaps an inflection point where data collected on international graduates or race may need to be revisited for use to support equity rather than to identify individuals for discipline.

The final consideration for this paper is that there is little research on the effectiveness of penalties for preventing reoffending. As a comparator, research in quality assurance and maintenance of competence programs has shown that programs involving peer-assessment and practice-based assessment are most effective in ensuring competence with less clear evidence for commonly used strategies such as continuing education credits/professional development requirements or learning portfolios.¹²³ A similar lens should be applied to discipline, where the goal of evaluation is to determine if disciplinary measures are actually effective in preventing reoffending. Little evidence exists for the efficacy of disciplinary penalties. Kiel argues that the use of conditions on a practitioner's license is not effective in protecting the public,⁶⁵ and while one study in nursing found that more conditions placed on a license and the use of suspension was associated with lower reoffending rates, this study was from 1999 and used a sample from one U.S. state.²⁷ Further comparison of disciplinary action penalties with quality assurance programs could be useful, recognizing that many factors such as funding and resources as well as regulatory body culture affect disciplinary action rates.^{21,52}

A few limitations should be considered. First, each jurisdiction has a different system to handle complaints and disciplinary action. Some regulators distinguish between the complaints process and the higher-level disciplinary action process that handles serious cases or cases where the parties cannot come to an agreement. However, other jurisdictions might not make this same distinction and studies from such jurisdictions might report complaints only. Papers on complaints data were excluded if it was determined that those jurisdictions had a separate process for higher-level disciplinary action cases. Papers that reported on both complaints and discipline processes were included in order to extract data on disciplinary action only. A few

papers that reported complaints data only were included if it was decided that the essence of the process was analogous to disciplinary action, and that the difference was due to that jurisdiction's system of handling such cases. Inclusion of studies

AS MOST OF THE AVAILABLE LITERATURE HAS BEEN CONDUCTED IN THE UNITED STATES AND HAS FOCUSED ON PHYSICIANS, MORE RESEARCH FROM OTHER JURISDICTIONS AND OTHER PROFESSIONS IS NEEDED.

focusing on complaints might overestimate the risk of demographic factors or reasons for discipline as some complaints are dismissed, and some complaints are resolved through mediation and might not result in a penalty. This highlights the difficulty in collecting data across different jurisdictions. Second, some full-text publications were not available due to limited library operations as a result of the COVID-19 pandemic and were excluded.

Conclusion

In this scoping review, we identified that a significant body of research has characterized the reasons for discipline, penalties, and characteristics and predictors of health practitioners subject to disciplinary action. Areas for future research are numerous. As most of the available literature has been conducted in the United States and has focused on physicians, more research from other jurisdictions and other professions is needed. While various characteristics and predictors of disciplinary action have been studied, an area for future research is how this information can be used to develop strategies to decrease disciplinary action and support health practitioners. This review also identified that many studies have assessed the types of penalties administered, but more research is needed about the efficacy of penalties in reducing the rate of reoffending and ensuring competence. This research is important for state boards, other regulators, and independent disciplinary councils who conduct disciplinary investigations. This research is highly relevant to the United States, where interstate medical licensure compacts have grown significantly in recent years.¹²⁴ Such compacts create a prime opportunity for comparison and for standardization of state board practices in a few areas, including the reporting of disciplinary action cases, the register of professionals, types of violations that are disciplined, and types of penalties that are applied. ■

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References

1. Adams T. Professional self-regulation and the public interest in Canada. *Professions & Professionalism*. 2016;6(3).
2. O'Reilly P. *Health Care Practitioners: An Ontario Case Study in Policy Making*. University of Toronto Press; 2000.
3. Gallagher CT, Mukhtar F, Sarfaraz T, Chaar B. Fit to practise? Processes for dealing with misconduct among pharmacists in Australia, Canada, the UK and US. *Research in social & administrative pharmacy: RSAP*. 2018.
4. Chamberlain J. The hearing of fitness to practice cases by the General Medical Council: Current trends and future research agendas. *Health, Risk & Society*. 2011;13:561-575.
5. Baker R. Professional regulation: Developing standards, criteria, and thresholds to assess fitness to practise. *BMJ*. 2006;332:230-3.
6. Bowen T, Saxton A. Procedural fairness in medical investigations and disciplinary proceedings. *J Law Med*. 2008;16(3):512-22.
7. Brands W, Welie J. Dentists in double trouble: The (un) fairness of punishing for the same mistake twice. *JADA*. 2008;139(9):1249-1255. <https://doi.org/10.14219/jada.archive.2008.0341>
8. Chiarella M, Satchell CS, Nagy M et al. Survey of quasi-judicial decision-makers in NSW and The National Registration Scheme for Health Practitioners. *J Law Med*. 2018; 25(2): 357-379.
9. Collins DB, Brown CA. The impact of the Cartwright Report upon the regulation, discipline and accountability of medical practitioners in New Zealand. *J Law Med*. 2009;16(4): 595-613.
10. Cook H, Gould D, Maben J, Stone K, Traynor M. Disciplinary processes and the management of poor performance among UK nurses: bad apple or systemic failure? A scoping study. *Nurs Inq*. 2014;21(1):51-8.
11. Gallagher CT, Hussain K, White JDP, Chaar B. The Legal Underpinnings of Medical Discipline in Common Law Jurisdictions. *J Leg Med*. 2019;39:5-34. <http://doi.org/10.1080/01947648.2019.1586602>.
12. Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology: Theory and Practice*. 2005;8(1): 19-32.

13. AbuDagga A, Wolfe SM, Carome M, Oshel RE. Cross-sectional analysis of the 1039 U.S. physicians reported to the national practitioner data bank for sexual misconduct, 2003-2013. *PLoS One*. 2016;11(2): e0147800. <http://doi.org/10.1371/journal.pone.0147800>.
14. AbuDagga A, Wolfe SM, Carome M, Oshel RE. Crossing the line: Sexual misconduct by nurses reported to the national practitioner data bank. *Public Health Nurs*. 2019;36(2): 109-117. <http://doi.org/10.1111/phn.12567>.
15. Alam A, Khan J, Klemensberg J, Griesman J, Bell CM. The characteristics of physicians disciplined by professional colleges in Canada. *Open Med*. 2011;5(4):166-172. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3345379/pdf/OpenMed-05-e166.pdf>. Published October 11, 2011.
16. Alam A, Khan J, Liu J, Klemensberg J, Griesman J, Bell CM. Characteristics and rates of disciplinary findings amongst anesthesiologists by professional colleges in Canada. *Can J Anaesth*. 2013;60(10): 1013-1019. <http://doi.org/10.1007/s12630-013-0006-8>.
17. Alam A, Kurdyak P, Klemensberg J, Griesman J, Bell CM. The characteristics of psychiatrists disciplined by professional colleges in Canada. *PLoS One*. 2012;7(11): e50558. <http://doi.org/10.1371/journal.pone.0050558>.
18. Banks S, Zasada M, Jago R, Gallagher A, Austin Z, Van Der Gaag A. Social workers under the spotlight: an analysis of fitness to practise referrals to the regulatory body in England, 2014-2016. *Br J Soc Work*. 2020;50(2): 326-347. <http://doi.org/10.1093/bjsw/bcz145>.
19. Barre L, Phengsavady A, Benson M, McDonald JV. Review of Rhode Island physician loss-of-licensure cases, 2009-2019. *R I Med J (2013)*. 2020;103(4): 46-49. <http://rimed.org/rimedicaljournal/2020/05/2020-05-46-contribution-barre.pdf>. Published May 1, 2020.
20. Birkeland S, Bogh SB. Education trajectories and malpractice complaints — a study among Danish general practitioners. *Cogent Education*. 2018;5(1): 1-6. <http://doi.org/10.1080/2331186X.2018.1473747>.
21. Birkeland S, Bogh SB. General practice location and malpractice litigation. *Rural Remote Health*. 2019;19(1): 4663. <http://doi.org/10.22605/RRH4663>.
22. Birkeland S, Christensen RD, Damsbo N, Kragstrup J. Characteristics of complaints resulting in disciplinary actions against Danish GPs. *Scand J Prim Health Care*. 2013;31(3): 153-157. <http://doi.org/10.3109/02813432.2013.823768>.
23. Birkeland S, Christensen RD, Damsbo N, Kragstrup J. Process-related factors associated with disciplinary board decisions. *BMC Health Serv Res*. 2013;13(9). <http://doi.org/10.1186/1472-6963-13-9>.
24. Campbell G, Rollin AM, Smith AF. Cases relating to anaesthetists handled by the UK general medical council in 2009: Methodological approach and patterns of referral. *Anaesthesia*. 2013;68(5): 453-460. <http://doi.org/10.1111/anae.12117>.
25. Cardarelli R, Licciardone JC, Ramirez G. Predicting risk for disciplinary action by a state medical board. *Tex Med*. 2004;100(1): 84-90.
26. Cardarelli R, Licciardone JC. Factors associated with high-severity disciplinary action by a state medical board: A Texas study of medical license revocation. *J Am Osteopath Assoc*. 2006;106(3): 153-156. <http://doi.org/10.7556/JAOA.2006.106.3.153>.
27. Chappell HW, Stanhope M, Dean PR, et al. Nursing law violations. A threat to competent and safe nursing practice. *JONAS Healthc Law Ethics Regul*. 1999;1(3):25-32. <http://doi.org/10.1097/00128488-199909000-00008>.
28. Clay SW, Conatser RR. Characteristics of physicians disciplined by the state medical board of Ohio. *J Am Osteopath Assoc*. 2003;103(2):81-88. <http://doi.org/10.7556/JAOA.2003.103.2.81>.
29. Cuddy MM, Young A, Gelman A, et al. Exploring the relationships between USMLE performance and disciplinary action in practice: A validity study of score inferences from a licensure examination. *Acad Med*. 2017;92(12): 1780-1785. <http://doi.org/10.1097/ACM.0000000000001747>.
30. Damiano PC, Shugars DA, Freed JR. Assessing quality in dentistry: Dental boards, peer review vary on disciplinary actions. *J Am Dent Assoc*. 1993;124(5): 113-131. <http://doi.org/10.14219/jada.archive.1993.0124>.
31. Davis CS, Carr DH. Self-regulating profession? Administrative discipline of "pill mill" physicians in Florida. *Subst Abuse*. 2017;38(3):265-268. <http://doi.org/10.1080/08897077.2017.1316812>.
32. Draime JA, Anderson DC, Anderson TS. Description and comparison of medication diversion in pharmacies by pharmacists, interns, and pharmacy technicians. *J Am Pharm Assoc*. 2003;58(3): 275-280. <http://doi.org/10.1016/j.japh.2018.02.009>.
33. DuBois JM, Anderson EE, Chibnall JT, Mozersky J, Walsh HA. Serious ethical violations in medicine: A statistical and ethical analysis of 280 cases in the United States from 2008-2016. *Am J Bioeth*. 2019;19(1): 16-34. <http://doi.org/10.1080/15265161.2018.1544305>.
34. Elkin K, Spittal MJ, Elkin D, Studdert DM. Removal of doctors from practice for professional misconduct in Australia and New Zealand. *BMJ Qual Saf*. 2012;21(12): 1027-1033. <http://doi.org/10.1136/bmjqs-2012-000941>.
35. Elkin K, Spittal MJ, Studdert DM. Risks of complaints and adverse disciplinary findings against international medical graduates in Victoria and Western Australia. *Med J Aust*. 2012;197(8): 448-452. <http://doi.org/10.5694/mja12.10632>.
36. Elkin KJ, Spittal MJ, Elkin DJ, Studdert DM. Doctors disciplined for professional misconduct in Australia and New Zealand, 2000-2009. *Med J Aust*. 2011;194(9): 452-456. <http://doi.org/10.5694/j.1326-5377.2011.tb03058.x>.
37. Enbom JA, Parshley P, Kollath J. A follow-up evaluation of sexual misconduct complaints: The Oregon Board of Medical Examiners, 1998 through 2002. *Am J Obstet Gynecol*. 2004;190(6): 1642-1653. <http://doi.org/10.1016/j.ajog.2004.02.058>.
38. Enbom JA, Thomas CD. Evaluation of sexual misconduct complaints: the Oregon Board of Medical Examiners, 1991 to 1995. *Am J Obstet Gynecol*. 1997;176(6): 1340-1346. [http://doi.org/10.1016/s0002-9378\(97\)70355-7](http://doi.org/10.1016/s0002-9378(97)70355-7).
39. Feine JS. The enforcement of regulations restricting expanded duties by dental auxiliaries: An analysis of the recent disciplinary actions of the Texas State Board of Dental Examiners. *J Public Health Dent*. 1991;51(2): 73-77. <http://doi.org/10.1111/j.1752-7325.1991.tb02184.x>.
40. Foong EA, Grindrod KA, Houle SKD. Will I lose my license for that? A closer look at Canadian disciplinary hearings and what it means for pharmacists' practice to full scope. *Can Pharm J (Ott)*. 2018;151(5): 332-344. <http://doi.org/10.1177/1715163518790773>.
41. Foreman SM, Stahl MJ. Chiropractors disciplined by a state chiropractic board and a comparison with disciplined medical physicians. *J Manipulative Physiol Ther*. 2004 Sep 1;27(7): 472-477. <http://doi.org/10.1016/j.jmpt.2004.06.006>.

42. Gallagher CT, De Souza AI. A retrospective analysis of the GDC's performance against its newly-approved fitness to practise guidance. *Br Dent J*. 2015;219(5): E5. <http://doi.org/10.1038/sj.bdj.2015.674>.
43. Gallagher CT, Dhokia C. One eye of the future, one eye on the past: The UK General Optical Council's approach to fitness to practise. *Int J Health Care Qual Assur*. 2017;30(8): 693-702. <http://doi.org/10.1108/IJHCQA-09-2016-0123>.
44. Gallagher CT. Factors associated with severity of sanctions among pharmacy professionals facing disciplinary proceedings. *Res Social Adm Pharm*. Published online April 25, 2020. <http://doi.org/10.1016/j.sapharm.2020.04.023>.
45. Gallagher CT, Foster CL. Impairment and sanction in Medical Practitioners Tribunal Service fitness to practise proceedings. *Med Leg J*. 2015;83(1): 15-21. <http://doi.org/10.1177/0025817214528205>.
46. Gallagher CT, Greenland VAM, Hickman AC. Eram, ergo sum? A 1-year retrospective study of General Pharmaceutical Council fitness to practice hearings. *Int J Pharm Pract*. 2015;23(3): 205-211. <http://doi.org/10.1111/ijpp.12151>.
47. Grant D, Alfred KC. Sanctions and recidivism: An evaluation of physician discipline by state medical boards. *J Health Polit Policy Law*. 2007;32(5): 867-885. <http://doi.org/10.1215/03616878-2007-033>.
48. Green A. Texas creates a profile of the disciplined professional nurse. *Issues*. 1996;17(2): 8-9.
49. Greysen SR, Chretien KC, Kind T, Young A, Gross CP. Physician violations of online professionalism and disciplinary actions: A national survey of state medical boards. *JAMA*. 2012;307(11): 1141-1142. <http://doi.org/10.1001/jama.2012.330>.
50. Hamolsky MW, Deary NS, Aronson SM. The physicians of Rhode Island: a summary of disciplinary action taken by the board of medical licensure and discipline. *Med Health R I*. 1998;81(10): 326-327.
51. Hanna A, Hanna LA. Topic analysis of UK fitness to practise cases: What lessons can be learnt? *Pharmacy (Basel)*. 2019;7(3):130. <http://doi.org/10.3390/pharmacy7030130>.
52. Harris JA, Byhoff E. Variations by state in physician disciplinary actions by US medical licensure boards. *BMJ Qual Saf*. 2017;26(3):200-208. <http://doi.org/10.1136/bmjqs-2015-004974>.
53. Holtman MC. Disciplinary careers of drug-impaired physicians. *Soc Sci Med*. 2007;64(3):543-553. <http://doi.org/10.1016/j.socscimed.2006.09.016>.
54. Hudson ML, Droppers OJ. Licensed nurses disciplined in Oregon between September 1996 and June 2008. *West J Nurs Res*. 2011;33(8): 1030-1046. <http://doi.org/10.1177/0193945910384491>.
55. Hudspeth R. Survey of advanced practice registered nurses disciplinary action. *Online J Issues Nurs*. 2007;12(2):7. <http://doi.org/10.3912/OJIN.Vol12No02PPT02>.
56. Humphrey C, Hickman S, Gulliford MC. Place of medical qualification and outcomes of UK General Medical Council "fitness to practise" process: Cohort study. *BMJ*. 2011; 342(): d1817. <http://doi.org/10.1136/bmj.d1817>.
57. Jeyalingam T, Matelski JJ, Alam AQ, et al. The characteristics of physicians who are re-disciplined by medical boards: A retrospective cohort study. *Jt Comm J Qual Patient Saf*. 2018;44(6): 361-365. <http://doi.org/10.1016/j.jcjq.2017.12.003>.
58. Jones JS, Fitzpatrick JJ, Drake VK. Frequency of postlicensure registered nurse boundary violations with patients in the state of Ohio: A comparison based on type of prelicensure registered nurse education. *Arch Psychiatr Nurs*. 2008;22(6): 356-363. <http://doi.org/10.1016/j.apnu.2007.09.001>.
59. Jones AT, Kopp JP, Malangoni MA. Recertification exam performance in general surgery is associated with subsequent loss of license actions. *Ann Surg*. 2020;272(6):1020-1024. <http://doi.org/10.1097/SLA.0000000000003330>.
60. Jonsson M, Nordén SL, Hanson U. Analysis of malpractice claims with a focus on oxytocin use in labour. *Acta Obstet Gynecol Scand*. 2007;86(3):315-319. <http://doi.org/10.1080/00016340601181318>.
61. Kenward K. Discipline of nurses: A review of disciplinary data 1996-2006. *JONAS Healthc Law Ethics Regul*. 2008;10(3): 81-84. <http://doi.org/10.1097/01.NHL.0000300787.36649.77>.
62. Khaliq AA, Dimassi H, Huang CY, Narine L, Smego RA Jr. Disciplinary action against physicians: Who is likely to get disciplined? *Am J Med*. 2005;118(7): 773-777. <http://doi.org/10.1016/j.amjmed.2005.01.051>.
63. Kiel H. Drugs, sex and the risk of recidivism: Psychiatry in the witness box. *Psychiatr Psychol Law*. 2006;13(1): 132-142. <http://doi.org/10.1375/pplt.13.1.132>.
64. Kiel H. Regulating impaired doctors: a snapshot from New South Wales. *J Law Med*. 2013;21(2): 429-440.
65. Kiel H. Doctors with conditions — Rehabilitation or risk. *J Law Med*. 2017;25(1): 62-76.
66. Kinney CL, Raddatz MM, Sliwa JA, Clark GS, Robinson LR. Does performance on the American board of physical medicine and rehabilitation initial certification examinations predict future physician disciplinary actions? *Am J Phys Rehabil*. 2019;98(12): 1079-1083. <http://doi.org/10.1097/PHM.0000000000001250>.
67. Kinney CL, Raddatz MM, Sliwa JA, Driscoll SW, Robinson LR. Association of participation in the American board of physical medicine and rehabilitation maintenance of certification program and physician disciplinary actions. *Am J Phys Med Rehabil*. 2020;99(4): 325-329. <http://doi.org/10.1097/PHM.0000000000001331>.
68. Kocher MS, Dichtel L, Kasser JR, Gebhardt MC, Katz JN. Orthopedic board certification and physician performance: An analysis of medical malpractice, hospital disciplinary action, and state medical board disciplinary action rates. *Am J Orthop (Belle Mead NJ)*. 2008;37(2): 73-75. <https://cdn.mdedge.com/files/s3fs-public/Document/September-2017/037020073.pdf>. Published February 2008.
69. Kohatsu ND, Gould D, Ross LK, Fox PJ. Characteristics associated with physician discipline: A case-control study. *Arch Intern Med*. 2004;164(6): 653-658. <http://doi.org/10.1001/archinte.164.6.653>.
70. Kreiner PW, Strickler GK, Undurraga EA, Torres ME, Nikitin RV, Rogers A. Validation of prescriber risk indicators obtained from prescription drug monitoring program data. *Drug Alcohol Depend*. 2017;173(1): S31-S38. <http://doi.org/10.1016/j.drugalcdep.2016.11.020>.
71. Kriisa M. Swedish malpractice reports and convictions. *Qual Assur Health Care*. 1990;2(3-4): 329-334. <http://doi.org/10.1093/intqhc/2.3-4.329>.

72. Kwee RM, Kwee TC. Medical disciplinary jurisprudence in alleged malpractice in radiology: 10-year Dutch experience. *Eur Radiol.* 2020;30(6): 3507-3515. <http://doi.org/10.1007/s00330-020-06685-0>.
73. Lipner RS, Young A, Chaudhry HJ, Duhigg LM, Papadakis MA. Specialty certification status, performance ratings, and disciplinary actions of internal medicine residents. *Acad Med.* 2016;91(3): 376-381. <http://doi.org/10.1097/ACM.0000000000001055>.
74. Liu JJ, Alam AQ, Goldberg HR, Matelski JJ, Bell CM. Characteristics of internal medicine physicians disciplined by professional colleges in Canada. *Medicine (Baltimore).* 2015;94(26): e937. <http://doi.org/10.1097/MD.0000000000000937>.
75. McDonald FS, Duhigg LM, Arnold GK, Hafer RM, Lipner RS. An American board of internal medicine maintenance of certification examination and state medical board disciplinary actions: A population cohort study. *J Gen Intern Med.* 2018;33(8): 1292-1298. <http://doi.org/10.1007/s11606-018-4376-z>.
76. Melo B, Julian L, McDonald JV. Review of boundary violations in Rhode Island, 2012-2018. *R I Med J (2013).* 2019;102(2): 36-38. <http://www.rimed.org/rimedicaljournal/2019/03/2019-03-36-cont-melo.pdf>. Published March 2019.
77. Mendelson D. Disciplinary proceedings against doctors who abuse controlled substances. *J Law Med.* 2015;23(1): 24-40.
78. Mendelson D. Disciplinary proceedings for inappropriate prescription of opioid medications by medical practitioners in Australia (2010-2014). *J Law Med.* 2014;22(2): 255-279.
79. Morelock S. Disparity in RN disciplinary actions by gender. *Nursing.* 2017;47(9): 45-49. <http://doi.org/10.1097/01.NURSE.0000521026.00015.be>.
80. Morrison J, Wickersham P. Physicians disciplined by a state medical board. *JAMA.* 1998;279(23): 1889-1893. <http://doi.org/10.1001/jama.279.23.1889>.
81. Munk LK. Implications of state dental board disciplinary actions for teaching dental students about emotional intelligence. *J Dent Educ.* 2016;80(1): 14-22. <http://doi.org/10.1002/j.0022-0337.2016.80.1.tb06053.x>.
82. Nasseri E. Disciplinary and legal actions against dermatologists in Canada. *J Cutan Med Surg.* 2016;20(1): 29-34. <http://doi.org/10.1177/1203475415598066>.
83. Nelson LS, Duhigg LM, Arnold GK, Lipner RS, Harvey AL, Reisdorff EJ. The association between maintaining American board of emergency medicine certification and state medical board disciplinary action. *J Emerg Med.* 2019;57(6): 772-779. <http://doi.org/10.1016/j.jemermed.2019.08.028>.
84. Neville P. Social media and professionalism: A retrospective content analysis of fitness to practise cases heard by the GDC concerning social media complaints. *Br Dent J.* 2017;223(5): 353-357. <http://doi.org/10.1038/sj.bdj.2017.765>.
85. Papadakis MA, Arnold GK, Blank LL, Holmboe ES, Lipner RS. Performance during internal medicine residency training and subsequent disciplinary action by state licensing boards. *Ann Intern Med.* 2008;148(11): 869-876. <http://doi.org/10.7326/0003-4819-148-11-200806030-00009>.
86. Papadakis MA, Hodgson CS, Teherani A, Kohatsu ND. Unprofessional behavior in medical school is associated with subsequent disciplinary action by a state medical board. *Acad Med.* 2004;79(3): 244-249. <http://doi.org/10.1097/00001888-200403000-00011>.
87. Papadakis MA, Teherani A, Banach MA, et al. Disciplinary action by medical boards and prior behavior in medical school. *N Engl J Med.* 2005;353(25): 2673-2682. <http://doi.org/10.1056/NEJMsa052596>.
88. Papinaho O, Häggman-Laitila A, Liedenpohja AM, Kangasniemi M. Integrative review of studies about nurses who have been disciplined by their professional regulatory bodies. *J Nurs Manag.* 2019;27(8): 1588-1603. <http://doi.org/10.1111/jonm.12883>.
89. Peabody MR, Young A, Peterson LE, et al. The relationship between board certification and disciplinary actions against board-eligible family physicians. *Acad Med.* 2019;94(6): 847-852. <http://doi.org/10.1097/ACM.0000000000002650>.
90. Phipps DL, Noyce PR, Walshe K, Parker D, Ashcroft DM. Pharmacists subjected to disciplinary action: Characteristics and risk factors. *Int J Pharm Pract.* 2011;19(5): 367-373. <http://doi.org/10.1111/j.2042-7174.2011.00119.x>.
91. Reich JH, Maldonado J. Empirical findings on legal difficulties among practicing psychiatrists. *Ann Clin Psychiatry.* 2011; 23(4): 297-307.
92. Richard J, Reidenberg MM. The risk of disciplinary action by state medical boards against physicians prescribing opioids. *J Pain Symptom Manage.* 2005;29(2): 206-212. <http://doi.org/10.1016/j.jpainsymman.2004.05.009>.
93. Roberts WL, Gross GA, Gimpel JR, et al. An investigation of the relationship between COMLEX-USA licensure examination performance and state licensing board disciplinary actions. *Acad Med.* 2020;95(6): 925-930. <http://doi.org/10.1097/ACM.0000000000003046>.
94. Ryan AT, Too LS, Bismark MM. Complaints about chiropractors, osteopaths, and physiotherapists: a retrospective cohort study of health performance, and conduct concerns. *Chiropr Man Therap.* 2018;26(12). <http://doi.org/10.1186/s12998-018-0180-4>.
95. Sansone RA, Sansone LA. Crossing the line: Sexual boundary violations by physicians. *Psychiatry (Edgmont).* 2009;6(6): 45-48. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2720840/pdf/PE_6_06_45.pdf. Published June 2009.
96. Santen SA, Petrusa E, Gruppen LD. The relationship between promotions committees' identification of problem medical students and subsequent state medical board actions. *Adv Health Sci Educ Theory Pract.* 2015;20(2): 421-430. <http://doi.org/10.1007/s10459-014-9536-2>.
97. Scofield JC, Gutmann ME, DeWald JR, Campbell PR. Disciplinary actions associated with the administration of local anesthetics against dentists and dental hygienists. *J Dent Hyg.* 2005;79(1):8. <https://jdh.adha.org/content/jdenthgy/79/1/8.full.pdf>. Published Winter 2005.
98. Spittal MJ, Studdert DM, Paterson R, Bismark MM. Outcomes of notifications to health practitioner boards: A retrospective cohort study. *BMC Med.* 2016;14(1): 198. <http://doi.org/10.1186/s12916-016-0748-6>.
99. Stewart RM, Love JD, Rocheleau LA, Sirinek KR. Tort reform is associated with more medical board complaints and disciplinary actions. *J Am Coll Surg.* 2012;214(4): 567-571. <http://doi.org/10.1016/j.jamcollsurg.2011.12.020>.

100. Strong D. Enforcement of commercial violations by health professional regulatory boards: a research note. *J Health Hum Serv Adm.* 2005/2006;28(3): 366-385.
101. Surgenor LJ, Diesfeld K, Ip M, Kersey K. New Zealand's health practitioners disciplinary tribunal: An analysis of decisions 2004-2014. *J Law Med.* 2016;24(1): 239-251.
102. Surgenor LJ, Diesfeld K. Outcomes of notifications against psychologists in the New Zealand health regulation context 2004-2015. *J Law Med.* 2018;25(3): 800-813.
103. Surgenor LJ, Diesfeld K, Rychert M. Consensual sexual relationships between health practitioners and their patients: An analysis of disciplinary cases from New Zealand. *Psychiatr Psychol Law.* 2019;26(5): 766-782. <http://doi.org/10.1080/13218719.2019.1640801>.
104. Taylor R, Ali MH, Howe TE, Varley I. Review of General Dental Council and General Medical Council "fitness to practise" hearings related to maxillofacial surgery. *Br J Oral Maxillofac Surg.* 2017;55(6):580-583. <http://doi.org/10.1016/j.bjoms.2017.03.008>.
105. Teherani A, Hodgson CS, Banach M, Papadakis MA. Domains of unprofessional behavior during medical school associated with future disciplinary action by a state medical board. *Acad Med.* 2005;80(10): S17-S20. <http://doi.org/10.1097/00001888-200510001-00008>.
106. Thomas LA, Tibble H, Too LS, Hopcraft MS, Bismark MM. Complaints about dental practitioners: an analysis of 6 years of complaints about dentists, dental prosthetists, oral health therapists, dental therapists and dental hygienists in Australia. *Aust Dent J.* 2018;63(3): 285-293. <http://doi.org/10.1111/adj.12625>.
107. Tiffin PA, Paton LW, Mwandigha LM, McLachlan JC, Illing J. Predicting fitness to practise events in international medical graduates who registered as UK doctors via the Professional and Linguistic Assessments Board (PLAB) system: A national cohort study. *BMC Med.* 2017; 15(1):66. <http://doi.org/10.1186/s12916-017-0829-1>.
108. Tullett J, Rutter P, Brown D. A longitudinal study of United Kingdom pharmacists' misdemeanours — trials, tribulations and trends. *Pharm World Sci.* 2003;25(2): 43-51. <http://doi.org/10.1023/a:1023288712923>.
109. Unwin E, Woolf K, Wadlow C, Dacre J. Disciplined doctors: Does the sex of a doctor matter? A cross-sectional study examining the association between a doctor's sex and receiving sanctions against their medical registration. *BMJ Open.* 2014;4(8): <http://doi.org/10.1136/bmjopen-2014-005405>.
110. Unwin E, Woolf K, Wadlow C, Potts HWW, Dacre J. Sex differences in medico-legal action against doctors: A systematic review and meta-analysis. *BMC Med.* 2015; 13():172. <http://doi.org/10.1186/s12916-015-0413-5>.
111. Vander Woude D. Characteristics of chemically dependent nurses disciplined by a rural state board of nursing. *Issues.* 1993;14(1): 3-10.
112. Wakeford R, Ludka K, Woolf K, McManus IC. Fitness to practise sanctions in UK doctors are predicted by poor performance at MRCGP and MRCP(UK) assessments: Data linkage study. *BMC Med.* 2018;16(1):230. <http://doi.org/10.1186/s12916-018-1214-4>.
113. Wallis KA, Middleton S. Doctors, drugs of dependence and discipline: A retrospective review of disciplinary decisions in New Zealand, 1997-2016. *N Z Med J.* 2019;132(1488): 49-54. https://assets-global.website-files.com/5e332a62c703f653182faf47/5e332a62c703f623682fcd59_Wallis%20FINAL.pdf. Published January 18, 2019.
114. Walton M, Kelly PJ, Chiarella EM, et al. Profile of the most common complaints for five health professions in Australia. *Aust Health Rev.* 2020;44(1): 15-23. <http://doi.org/10.1071/AH18074>.
115. Webster SH. Professional misconduct. *Ophthalmic Physiol Opt.* 1995;15(4): 327-337. <http://doi.org/10.1046/j.1475-1313.1995.9500081n.x>.
116. Yates J, James D. Risk factors at medical school for subsequent professional misconduct: Multicentre retrospective case-control study. *BMJ.* 2010;340():c2040. <http://doi.org/10.1136/bmj.c2040>.
117. Yeon HB, Lovett DA, Zurakowski D, Herndon JH. Physician discipline. *J Bone Joint Surg Am.* 2006;88(9): 2091-2096. <http://doi.org/10.2106/JBJS.F.00524>.
118. Zhong EH, Kenward K, Sheets VR, Doherty ME, Gross L. Probation and recidivism: Remediation among disciplined nurses in six states. *Am J Nurs.* 2009;109(3): 48-50, 52-57. <http://doi.org/10.1097/01.NAJ.0000346931.36111.e9>.
119. Zhou Y, Sun H, Culley DJ, Young A, Harman AE, Warner DO. Effectiveness of written and oral specialty certification examinations to predict actions against medical licenses of anesthesiologists. *Anesthesiology.* 2017;126(6): 1171-1179. <http://doi.org/10.1097/ALN.0000000000001623>.
120. Zhou Y, Sun H, Macario A, et al. Association between performance in a maintenance of certification program and disciplinary actions against the medical licenses of anesthesiologists. *Anesthesiology.* 2018; 129(4): 812-820. <http://doi.org/10.1097/ALN.0000000000002326>.
121. McHugh M. Interrater reliability: The kappa statistic. *Biochem Med (Zagreb).* 2012 Oct; 22(3): 276-282.
122. Archibong U, Kline R, Eshareturi C, McIntosh B. Disproportionality in NHS disciplinary proceedings. *Br J Health Care Manag.* 2019. <https://doi.org/10.12968/bjhc.2018.0062>.
123. Austin Z, Gregory P. Quality Assurance and Maintenance of Competence Assessment Mechanisms in the Professions: A Multi-Jurisdictional, Multi-Professional Review. *J Med Regul.* 2017;103(2): 22-34. <http://doi.org/10.30770/2572-1852-103.2.22>.
124. Robeznieks A. Cross-state licensing process now live in 30 states. American Medical Association. Published April 26, 2021. Accessed Dec 2, 2021. <https://www.ama-assn.org/practice-management/digital/cross-state-licensing-process-now-live-30-states>.

Appendix A: Search Strategy

PubMed Search Strategy (Literature Search performed June 5, 2020):

(pharmacists[mesh] OR pharmacist* OR physicians[mesh] OR physician* OR doctor* OR nurses[mesh] OR nurs* OR "nurse practitioners" [mesh] OR "nurse practitioner*" OR dentists[mesh] OR dentist* OR "allied health personnel"[mesh] OR "allied health personnel" OR "pharmacy technician*" OR anesthetists[mesh] OR anesthetist* OR anaesthetist* OR chiropract* OR "massage therap*" OR midwif* OR midwife* OR naturopath* OR osteopath* OR audiologists[mesh] OR audiologist* OR dental staff[mesh] OR "dental staff" OR nutritionists[mesh] OR nutritionist* OR dietician* OR dietitian* OR "speech language path*" OR chiropod* OR podiatr* OR homeopath* OR kinesiology* OR "laboratory technician*" OR "radiation technolog*" OR optician* OR psycholog* OR psychotherap* OR "respiratory therap*" OR acupunctur* OR sonograph* OR "emergency medical technicians"[mesh] OR "emergency medical technician*" OR paramedic* OR "occupational therapists"[mesh] OR "occupational therapist*" OR optometrists[mesh] OR optometrist* OR "physical therapists"[mesh] OR "physical therapist*" OR physiotherap* OR "health personnel"[mesh] OR "health personnel" OR "healthcare provider*" OR "health care provider*" OR "health care personnel" OR "healthcare personnel" OR "health care professional*" OR "healthcare professional*" OR "regulated health profession*") AND ("disciplinary action*" OR "disciplinary procedure*" OR "disciplinary proceeding*" OR "employee discipline"[mesh] OR "employee discipline" OR "fitness to practice" OR "fitness to practise")

Appendix B: Data Extraction Form Sample

Author/Year
Title
Country of sample
Study design
Study objective
Sample
Source of data
Sample size
Timeframe
Inclusion criteria
Exclusion criteria
Comparator group
Group differences
Other key findings
Key findings: Reasons for disciplinary action
Key findings on sexual misconduct
Key findings on clinical care concerns
Key findings on unprofessional conduct
Key findings on substance use
Other key findings on reasons for disciplinary action
Characteristics/predictors of disciplinary action
Key findings on gender
Key findings on age
Key findings on years in practice
Key findings on international graduates
Key findings on board certifications
Key findings on licensing exam performance
Key findings on license type
Key findings on specialty
Key findings on previous or repeated disciplinary action
Key findings on other characteristics/predictors
Key findings on rate of disciplinary action
Method limitations

Appendix C: Characteristics and Results of Included Studies

To view Appendix C online, please visit <http://hdl.handle.net/10012/17896>